Annotations in this document have been made by Lewis Perdue,
Publisher and Executive Editor of Wine Industry Insight.

Perdue received his B.S. degree (With Distinction) from the Cornell University College of Agriculture and Life Sciences having majored in both Communications and in Ecology, Evolution, and Systematics with additional coursework in organic chemistry, geology, and the law school.

Review, Analysis and Opinion of the U.S. Department of Justice Expert Team Report, Duarte Nursery, Inc. US Army Corps of Engineers/ United States v Duarte Nursery, Inc. et al

Prepared for John Duarte, Duarte Nursery, Inc.
by
Sidney W. Davis, CPSS; David W. Smith; and Alan J. Busacca, Ph.D., CPSS, RG

March 2019

TABLE OF CONTENTS

Review, Analysis and Opinion of the U.S. Department of Justice Expert Team Report, Duarte Nursery, Inc. US Army Corps of Engineers/ United States v Duarte Nursery, Inc. et al

Prepared for John Duarte, Duarte Nursery, Inc. by
Sidney W. Davis, CPSS; David W. Smith; and Alan J. Busacca, Ph.D., CPSS, RG

Executive Summary

This report is a review and critique of a document titled: US Department of Justice Expert Team report, Duarte Nursery, Inc. et al. US Army Corps of Engineers/United States v. Duarte Nursery, Inc., et al., prepared for Environment and Resource Defense Section, Washington D.C. regarding a dispute over farming operations on a property in Tehama County California and impacts or alleged impacts of farming operations on hydrology, wetlands, and water quality. In our review, we offer a very different set of interpretations and recommendations than those in the Expert Team report. It is our opinion that the Duarte Site is an on-going farming and ranching operation and that the fundamental assumptions, design, and data collection of the Expert Team's studies were deeply flawed such that their conclusions and recommendations should be set aside.

Absent in all the reports reviewed is a discussion by the experts on both sides of the case about Section 404(f)(1), the agricultural exemptions, and what is allowed under "normal" farming practices. The Lee Report failed to present a case that the wetlands had been diminished in "impairment in flow and circulation and reduction in reach of wetlands" (§ 404(f)(1)). Further, in our opinion the Lee Report's interpretations are often contradicted by the supporting data they provide.

Nearly the entire Coyote Creek Watershed, what is represented by the Duarte Site and the offsite Reference Sites (Area 13 and Ag Area), has a history of on-going farming and ranching operations, based on publications and historic aerial photos supplied by both sides of the legal argument.

In the final analysis of all the previously developed reports surrounding the Duarte Site tillage issue, each party analyzing the tillage (Lee, Kelley, Skordal, Butterworth) agrees that deep ripping or deep tillage did not occur. The Lee Report documents seven inches of tillage depth, while the Butterworth and Kelly Reports document less than that depth. Once it was discovered that deep ripping had not occurred, it is our opinion that the Lee Report should have recommended to proceed under § 404(f)(1) and recognize the exemptions therein.

The hydrogeomorphic assessment (HGM) based on inference from the Reference Sites are predicated on geology and soils that are different than the majority of those on the Duarte site, and consequently assessments of damages are, in our opinion, not credible and must be set aside.

The analysis on page 155 of the Lee Report states that "… although the depth of tillage, soil type and slowly permeable layers and gear used on the Duarte Site are not exactly the same as on the Borden Ranch Property, the effect of the tillage activity regardless of depth was functionally the same, breakup of the slowly permeable layer to alter the hydrologic conditions on which water / wetlands depend and set the site for vertical movement of water in the soil profiles to support crop production." This is where there is a departure from standard interpretations in site hydrology. The seven-inch tillage practice did nothing to alter the slowly permeable soil layers and the Duarte site hydrology is left performing as it did prior to tillage.

Had the initial tillage operation that created the furrows across the Duarte Site been allowed to finish with the seedbed preparation step, the furrows would have been reworked to a smoother surface, and what appears to be objectionable to the Lee Report would have been less apparent. A second move to finish seedbed preparation (harrowing) would have likely left the site in a very similar condition as to what is seen in the Reference Areas, a condition used by the Lee Report against the farmer to assess damages in the comparison between the two. The recommended restoration methodology now being imposed will accomplish essentially what the seedbed finishing would have, antecedent the "cease and desist" order.

Introduction

At the request of Mr. John Duarte, we reviewed the document titled: *US Department of Justice Expert Team report, Duarte Nursery, Inc. et al. US Army Corps of Engineers/United States v. Duarte Nursery, Inc., et al., prepared for Environment and Resource Defense Section, Washington D.C.* and all appendices, photos, maps, etc. associated with that document. The authors of the document we reviewed are Lyndon Lee, Ph.D., PWS; Richard A. Lis, Ph.D.; Wade L. Nutter, Ph.D., PH; Mark C. Rains, Ph.D., PWS; Scott Stewart, Ph.D., CPSS; W. Clark Hurst. They were retained by the U. S. Department of Justice (DOJ) in the action named in the document title. In our comments below we will refer to the authors as the "Team of Experts" and the report itself and any of its appendant parts as the "Lee Report'. We also reviewed as necessary the salient parts of reports prepared for Mr. Duarte by Joel Butterworth, M.S.; Ren Fairbanks, B.S.; David B. Kelley, M.S.; Diane S. Moore, M.S.; and Thomas M. Skordal, B.S.

The report that follows here is the product of our review. In it, we offer a very different set of interpretations and recommendations than those in the Lee Report. It is our opinion that the Duarte Site is an on-going farming and ranching operation; reference sites chosen by the Team of Experts for the study are not representative of the Duarte site; and, the contention that hydrology has changed is not supported by the facts presented in the Lee Report.

The opinions offered here are based on standard practices of soil science mainly developed by the USDA Natural Resources Conservation Service (NRCS) (formerly the Soil Conservation Service) under the umbrella of National Cooperative Soil Survey (NCSS), including several federal agencies and the Land Grant Universities across the U.S. It is from these standards that criteria for hydric soils were developed and from these were developed the rationale and rules that underpin the Clean Water Act, Section 404. These standards and documents serve to provide due process to the regulated public. Other interpretations of soil functionality such as hydrologic soil group (USDA, 2007), runoff, infiltration, permeability (saturated hydraulic conductivity) related to erodibility are also based on NCSS standard interpretations.

Environmental Setting – Geology and Soils

A 451-acre field that we will refer to in this report as the “Duarte Site” is located south of Coyote Creek and its intersection with Paskenta Road, about 5.2 airline miles southwest of Red Bluff in Tehama County, CA. The northern property boundary roughly follows Coyote Creek eastward from Paskenta Road, zigs back to the west, turns south and extends to the intersection of Dusty Way and Paskenta Road. From there it follows Paskenta Road northward to Coyote Creek along the site’s western boundary (Fig. 1).

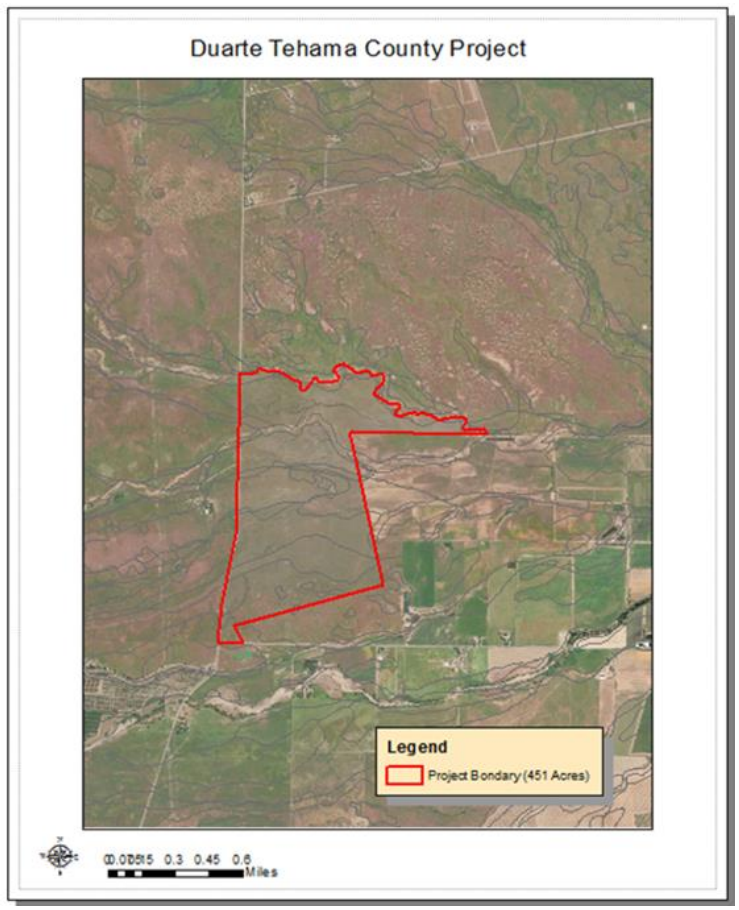


Figure 1 - Duarte Site Boundary

The geologic units that underlie the Duarte Site and surrounding area consists of Pleistocene-age alluvial (stream-deposited sedimentary) deposits. From older to younger these are the Red Bluff Formation, Lower Riverbank Formation, and Upper Riverbank Formation. The Red Bluff Formation was laid down between approximately 1.08 million years and 450,000 years ago (Helley and Harwood 1985; Helley and Jaworowski 1985) and the two units of the Riverbank Formation are estimated to have been deposited between about 450,000 years and 130,000 years ago (Marchand and Allwardt 1981).

The Riverbank Formation is a dissected alluvial fan (now an alluvial terrace because has been uplifted above stream level and thus is no longer capable of receiving sediment deposition from adjacent streams) that is inset into the dissected terrace of the Red Bluff Formation and older materials beneath (Helley and Harwood, 1985; Blake, et. al., 1999.).

Small areas of the still-younger Modesto Formation (Upper Pleistocene: deposited between about 130,000 years and 10,000 years ago (Marchand and Allwardt 1981)) occur along the margins of Coyote, Willow, and Oat Creeks, and the creeks themselves as well as the ephemeral waterways that are the subject of this action are underlain by still younger Holocene-age to modern (12,000 years to present) stream sediments.

A veneer of red gravels cap the Red Bluff Formation in areas shown in the red and green colors on the geologic map (Fig. 2). Although all of these formations of alluvium were laid down by ancestral streams, each of these deposits or formations has been beheaded from its source streams to the west and north by ongoing uplift of the northern Coast Range during the Pleistocene.

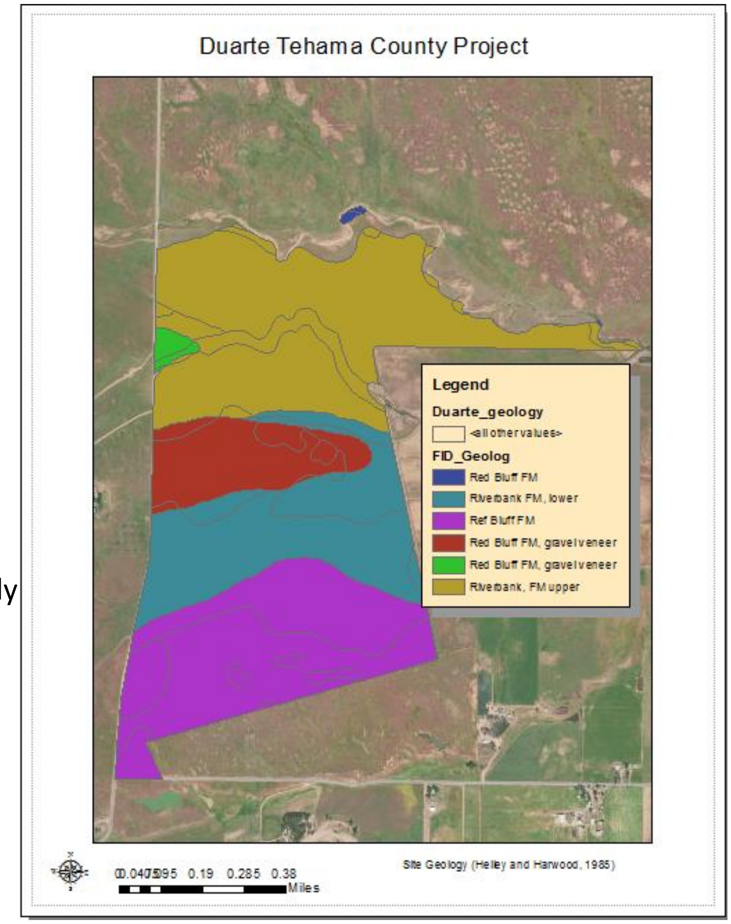


Figure 2 - Duarte Site Geology (Helly and Harwood, 1985)

Different soil types or soil series are inextricably associated with each of these different geologic formations as documented in the soil survey of the Tehama County Area (Gowans, 1967). Deeply and highly weathered, strongly developed Red Bluff (Palexeralfs), Redding (Durixeralfs), and Corning (Palexeralfs) soils with deep red colors (2.5YR and 5YR Munsell color hues) are associated with the oldest local unit, the Red Bluff Formation.

Younger and somewhat less weathered but still very strongly developed Arbuckle and Perkins soils (*Haploxeralfs*) with 5YR, 7.5YR, and 10YR Munsell color hues are associated with the Riverbank Formation. The Pleistocene-age terraces are no longer receiving sediment contributions over their surfaces from the former watershed that delivered these parent materials. They are generally being eroded over the millennia by geologic forces as can be seen by moderate incision across the terrace surfaces. A veneer or 'lag' of gravel up to a few meters thick mantle some of the surfaces of the Red Bluff Formation.

Seasonal drainage networks that are under review here have formed on the terraces, some of which are internally drained (do not empty into a through-going trunk stream) and some of

which connect and drain at least infrequently to Coyote, Willow, and Oat Creeks.
Soil map units (SMUs) of the Duarte Site are shown in Figure 3.

Farming History of the Duarte Site and Surrounding Lands

The soil map unit description for 'AvA' Arbuckle gravelly loam, 0 to 2 percent slopes in Gowan (1967) states: "Row crops, field crops and orchard crops are grown successfully on the Arbuckle soils" and "Alfalfa, corn, beans, milo, irrigated pasture plants, olives, prunes, grain and similar crops can be grown successfully on this Arbuckle soil." Both soil map units of Arbuckle ('AvA' and 'Aw") classify as "Prime Farmland If Irrigated" under the Farmland Classification system (USDA, 1978). Descriptions like these from a soil survey prepared in the 1950s and 1960s as well as a photo published in the Tehama County soil survey report (shown in our Figure 4) demonstrate a long history of farming on these rolling lands. SMUs 'AvA' and "Aw" are classified in hydrologic soil group B (USDA, 2007).

Soil map units 'PkA' Perkins gravelly loam, 0 to 3 percent slopes and 'PkB' Perkins gravelly loam, 3 to 8 percent slopes also classify as "Prime Farmland If Irrigated." To alter the hydrology appreciably in these SMUs classed as hydrologic soil group C would require ripping beyond 40 inches depth and in fact perhaps also installation of tile drainage to effect a permanent change.

Soil map unit 'CyB' Corning-Redding gravelly loams, 3 to 8 percent slopes is not Prime Farmland and

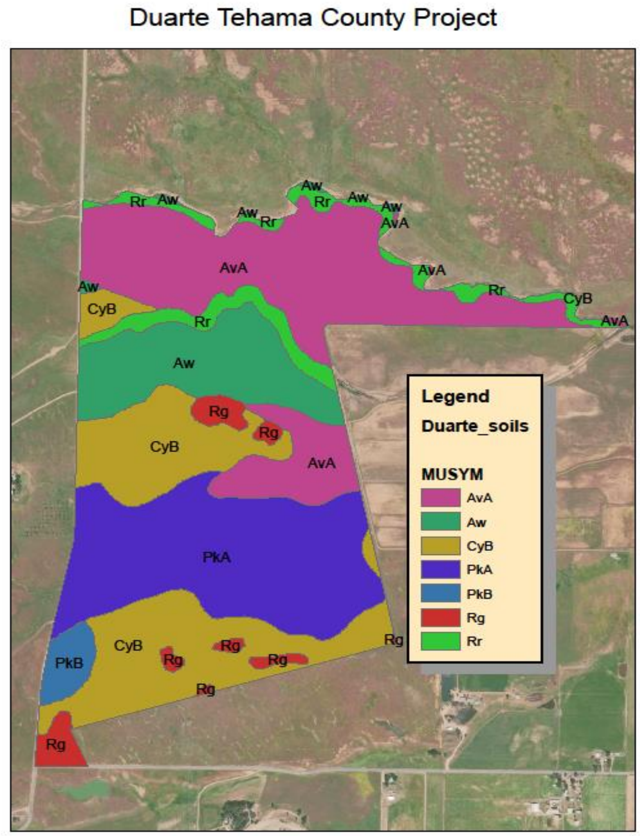


Figure 3 - Duarte Site Soils (SSURGO, NRCS 2016)

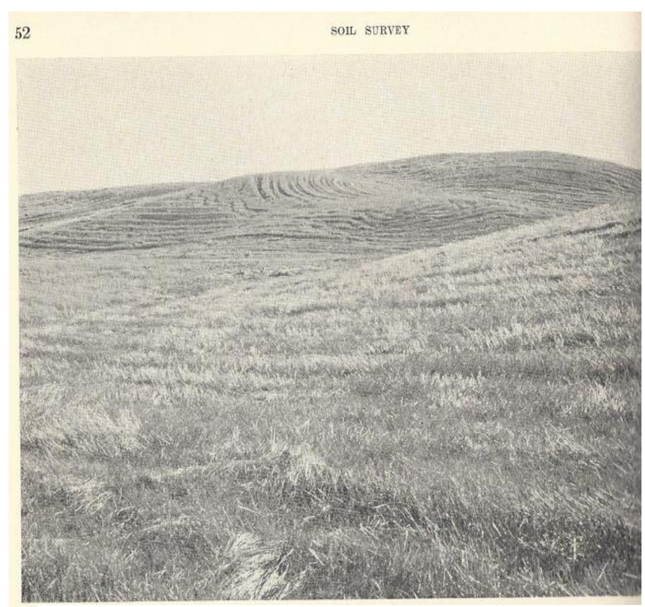


Figure 4 - Photo from Gowens (1967) taken about 7 miles west of the Duarte Site sometime prior to 1968 showing dryland grain harvested on old terraces.

both soils in the map unit are classed in hydrologic soil group D. The restrictive layer in the Corning soil is described as having a texture of clay from 21 inches to 29 inches depth; the Redding soil is described as having a restrictive layer consisting of an argillic horizon with a texture of clay from 19 inches to 22 inches and a silica-cemented duripan from 22 inches to greater than 35 inches depth. Tillage to 7 inches depth in either one of these soils in the CyB soil map unit complex would have no deleterious effect on their normal hydrologic function (neither infiltration rate nor runoff potential).

The Prime Farmland/Not Prime Farmland division of the Duarte Site is shown in Figure 4 and Table 1 below. The Duarte Site includes about 317 acres Red Bluff, Arbuckle and Perkins soils (SMUs AyA, Aw, PkA, PkB, and Rg) classed as “Prime Farmland If Irrigated”. The remaining 134 acres (SMUs CyB and Rv) are classed “Not Prime Farmlands”.

MUSYM	Farm Land Class	Acres
Rg	Prime farmland if irrigated	0.1
Rg	Prime farmland if irrigated	1.0
Rg	Prime farmland if irrigated	0.3
AvA	Prime farmland if irrigated	104.3
Rg	Prime farmland if irrigated	4.3
Rg	Prime farmland if irrigated	1.5
Rg	Prime farmland if irrigated	5.4
PkB	Prime farmland if irrigated	9.2
Rg	Prime farmland if irrigated	1.2
PkA	Prime farmland if irrigated	108.4
Aw	Prime farmland if irrigated	53.0
AvA	Prime farmland if irrigated	0.2
CyB	Not prime farmland	61.6
AvA	Prime farmland if irrigated	24.6
Rg	Prime farmland if irrigated	1.6
AvA	Prime farmland if irrigated	0.3
Rr	Not prime farmland	26.4
Aw	Prime farmland if irrigated	0.5
CyB	Not prime farmland	6.0
Aw	Prime farmland if irrigated	1.1
CyB	Not prime farmland	40.6

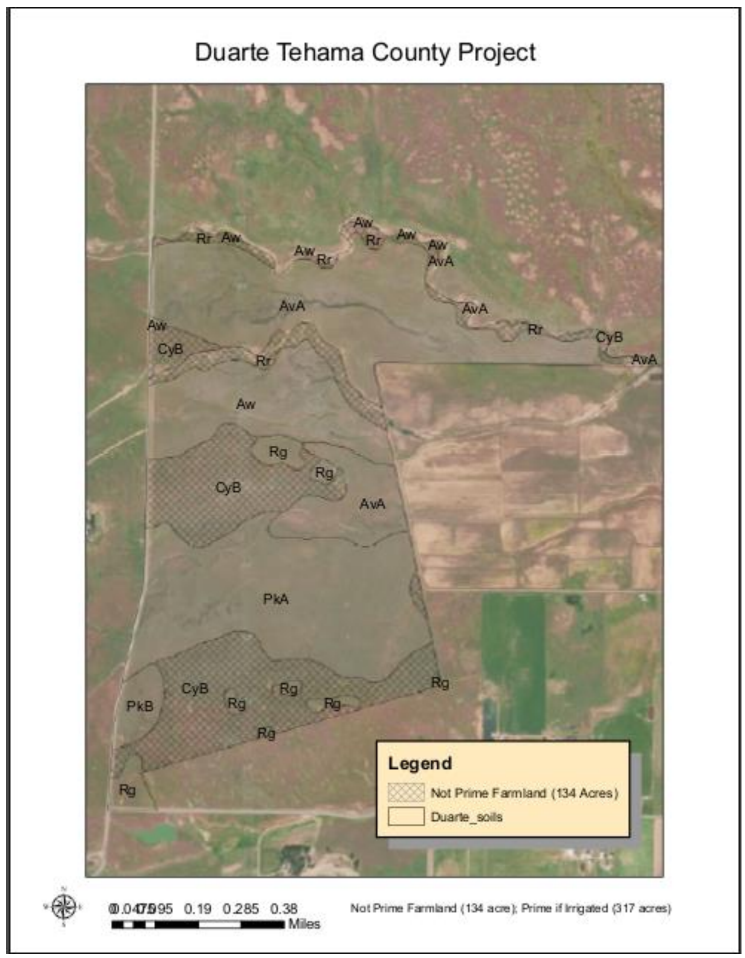


Figure 5 and Table 1 – Duarte Site Farmland Classification.

Inspection of Figures 6 and 7 show visual evidence of tillage on the Duarte Site and indeed a history of cultivation across the entire landform, including the high and low terraces. Less obvious are striations on Fig. 6, close inspection reveals tillage in the CCCA Reference Agricultural Area as well (left side, top edge of the photo).

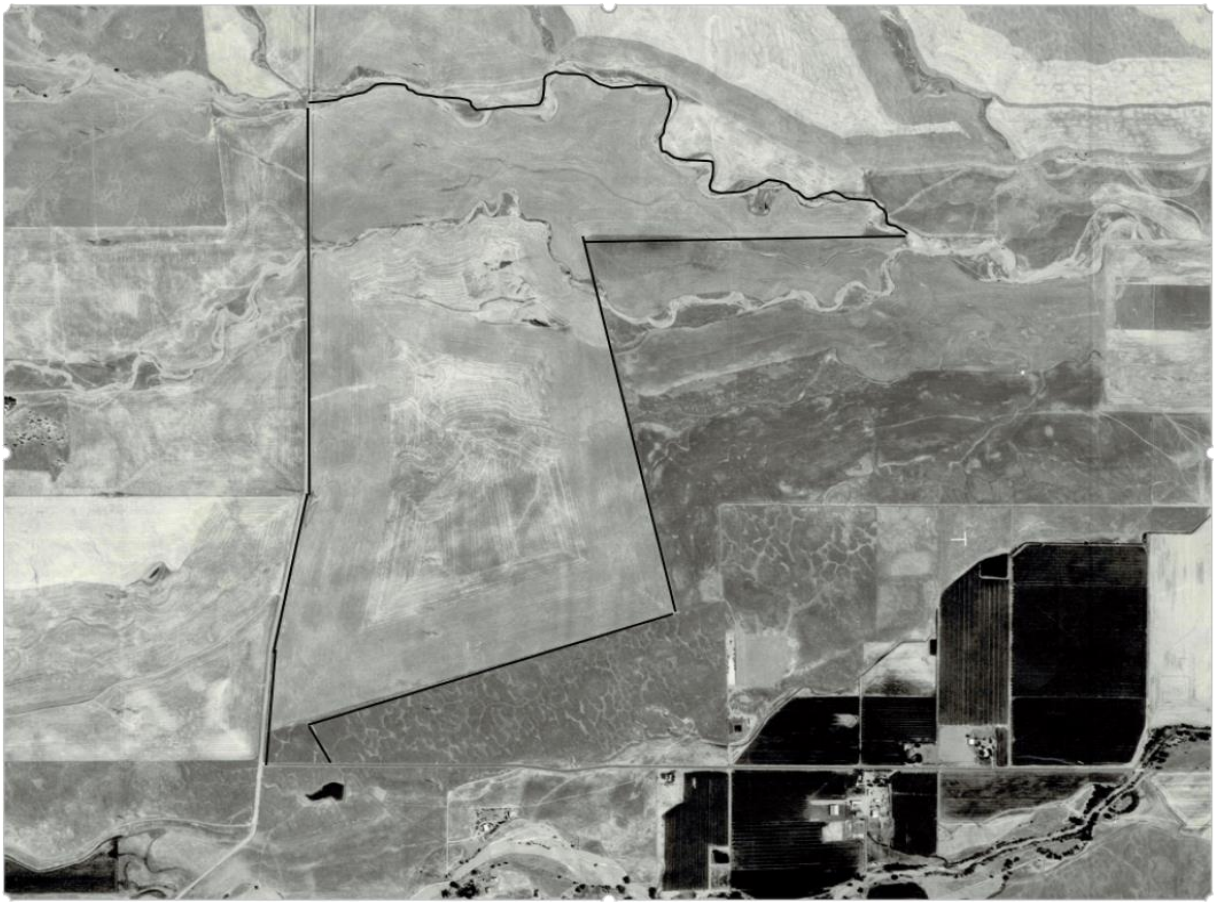


Figure 6 – Aerial Photo Ca. 1979 (USDA) showing tillage on the Duarte Site (Skordal, 2015). The whole site including streams have been subject to tillage. Boundary approximate.

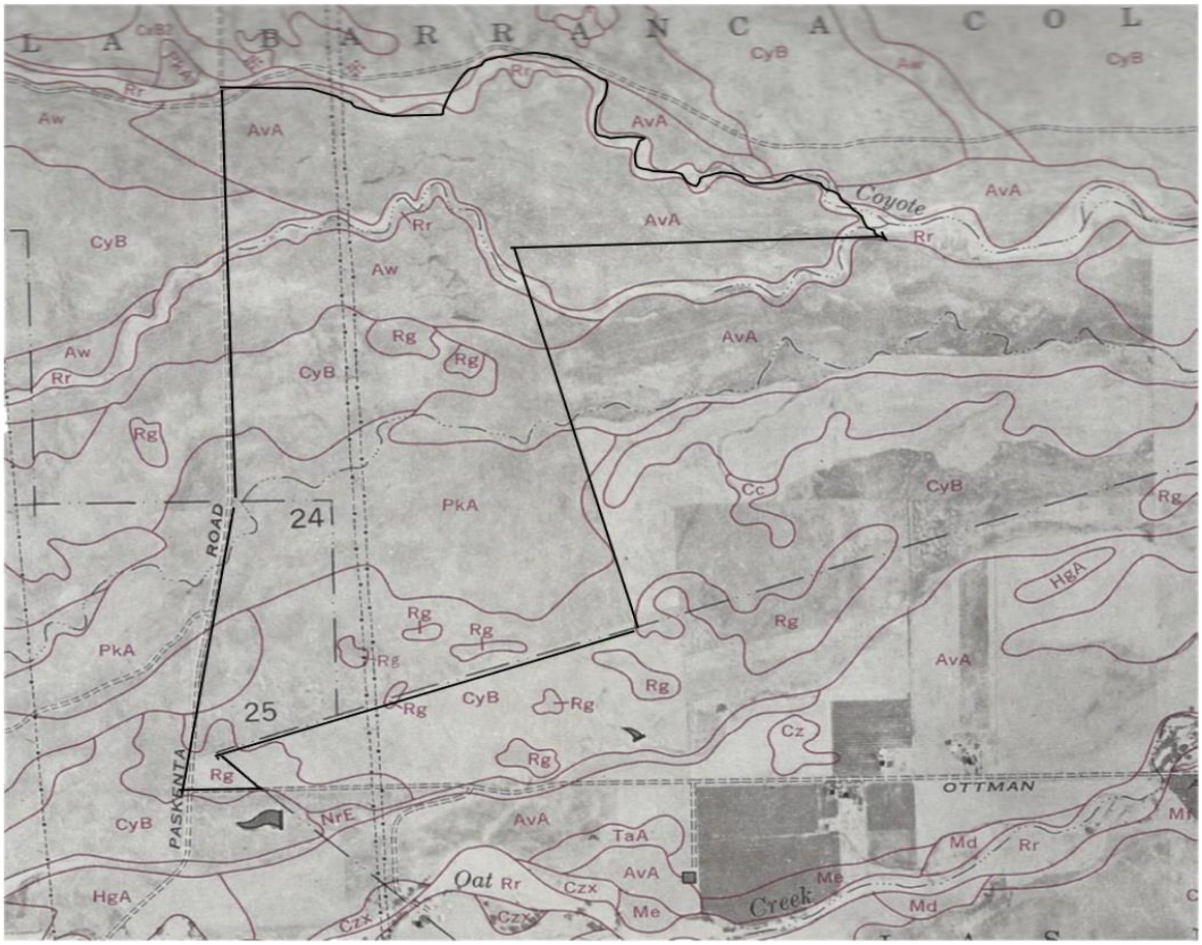


Figure 7 -- Portion of Sheet 89 from Tehama County Soil Survey, CA (Gowens, 1967), showing tillage on the very southwestern tip. Boundary approximate.

Analysis

The Lee Report involved at least 5 principal scientists. The report itself is almost two hundred pages long and in addition, the appendices add several hundred pages more of written documents, tables, photos, maps, field sheets, lists, etc. No doubt it represents an extraordinary amount of work … but are its observations meaningful, correct, and even applicable to the Duarte Site?

In our careful reading of the Lee Report and the re-analysis of available data that we present in the rebuttal report here, and with our combined 120 years of professional experience in soils, hydrology, agriculture, landscape analysis, and the regulatory framework of Section 404 of the Clean Water Act, we will show counter evidence to the Lee Report and we will show what we believe to be errors in experimental design, data collection, and application of Clean Water Act statutes, as well as irrelevant or factually unsupportable interpretations for virtually every claim or conclusion made by those authors.

The Lee Report examined wetlands and alleged wetlands that they claim were damaged in 2012 by tillage equipment on the Duarte Site in Tehama County. In the following sections, we will show that:

1) The tillage on the Duarte Property should have qualified for an agricultural activity exemption under special rules of the Clean Water Act (CWA) Section 404(f) relating to wetlands and agricultural areas. The authors of the Lee Report did not mention these provisions of Federal Law. They apparently disregarded Section 404(f) without explicitly presenting their NOT applying the agricultural area exemption provisions to the Duarte Site. Instead, we will show that they incorrectly decided that the Duarte Site was not being actively farmed, a claim that our inclusion of historic aerial photographs and USDA Farm Service Agency (FSA) records clearly shows was an active farming and ranching operation. Thus, we infer that Expert Team fell short in their research and did not do the necessary minimum of due diligence in reaching their conclusions.

Once the Expert Team had, we believe, incorrectly applied the exemption provisions in CWA Section 404(f), we find further that:

2) The Reference Areas selected and studied by the authors of the Lee Report are unlike those on the Duarte Site, leading to erroneous conclusions in the Hydrogeomorphic (HGM) Assessment they presented in Appendix D and in the Results sections of their report.

3) The field data collected by the authors of the Lee Report, particularly the absence of observations of the soil profiles below about 10” to 15" depth is insufficient to support the

claims that tillage operations conducted in the course of normal farming caused major changes to hydrologic soil group (HSG) and wetland function on the Duarte Site.

Other items at issue that we will rebut or oppose below include:

4) The authors of the Lee Report made numerous errors on their Field Data sheets (Appendices A, B, and C): for example, the Expert Team widely and incorrectly applied the F8 Redox Depressions hydric soil indicator in the Field Indicators of Hydric Soils in the United States (USDA, 2010), which is specifically defined to be used *only for closed depressions (p. 23),* to through-going intermittent or ephemeral channels.

5) The authors of the Lee Report also incorrectly infer site hydrology from soils data, which we believe should lead to the conclusion that swale portions of the Duarte Site are in fact not jurisdictional wetlands.

6) The authors of the Lee Report further infer without evidence that the hydrologic soil group (HSG) has been altered by tillage on the Duarte Site to an extent that it could reduce ponding or runoff within the alleged wetlands. That is, the Expert Team asserts that the Duarte Site incurred damages similar to farm fields receiving deep ripping to many feet even though documentary evidence from other experts and even from the Expert Team itself shows that tillage on the Duarte Site extended in most cases only to about 8 inches.

7) The authors of the Lee Report conclude but do not successfully demonstrate that wetlands occurring on the Duarte Site have been impacted to the extent that impairment in flow and circulation and reduction in reach of wetlands (Section 404(f)(1), Clean Water Act) due to the tillage operations carried out in November and December of 2012.

8) Once the Team of Experts discovered and documented in their Appendix A that conventional tillage was used on the Duarte Site, not deep ripping, we believe that they should have ceased further work on their investigation and should have concluded that the project should be processed by protocols under the Exemptions in § 404(f)(1) of the Clean Water Act.

Provisions of Federal Law Relating to Wetlands and Agricultural Areas

The Clean Water Act (CWA) Section 404(f) exempts certain agricultural activities from the need for a permit. The tillage activity on the Duarte Site appears to be eligible for the exemption under these rules. We reviewed the rules following the Environmental Protection Agency (EPA) guidance memorandum titled *CWA Section 404 Regulatory Program Agricultural Activities* (CWA 404 Policy and Guidance) and cross-referenced to documents in the U.S. Code: the U.S.

Army Corps of Engineers' (ACOE) *Discharges not requiring permits* (33 CFR § 323.4) and the EPA's *Activities not requiring permits* (40 CFR § 232.3).

CWA Section 404(f)(1) identifies specific activities for which the discharge of dredged or fill material *"is not prohibited or otherwise subject to regulation"*. These activities include *"normal farming, silviculture, and ranching activities such as plowing, seeding, cultivating, minor drainage, harvesting for the production of food, fiber, [etc.]"*

To be exempt, normal farming activities must be part of an established, ongoing operation. Quoting from the memorandum: "In determining whether an activity is part of an established operation, several points need to be considered":

"First, the specific farming activity need not itself have been ongoing if it is introduced as part of an ongoing farming operation." The Duarte Site was chisel plowed in 2012 to prepare a seedbed for wheat. This was part of a long-established, ongoing farming and ranching operation as evidenced by the history of dryland farming and ranching operations occurring throughout the gently sloping foothills and terraces in the western part of the Sacramento Valley region, including in Tehama county and on the Duarte Site (Kelly, 2015; Gowans, 1967; and Holmes, et al., 1913). Dry farmed grain and ranching lands might be less intensively cultivated than irrigated croplands, but periodic cultivation is a normal farming phase in the area. The time interval between periods of farming dryland grain and grazing of livestock might extend over many years, but it's a continuous agricultural operation. The Duarte Site met the first consideration.

"Second, the planting of different agricultural crops as part of an established rotation is exempt." Many agricultural landowners on the sloping foothills and terraces of the westside of the Sacramento Valley have followed an irregular sequence of periodic cultivation to produce dryland crops followed by periods of grazing and/or fallowing of the land; the protocol is determined by rainfall, crop and cattle prices, ownership, generally low productivity, and equipment availability, among other factors (Kelly 5-6). The general sequence is: 1) chisel plow to scarify the soil surface, then seed to dryland wheat or barley, and harrow or lightly disk to cover the seed; 2) harvest the crop as grain or hay, or sometimes graze it before seed set—decisions that depend on the seasonal rainfall and plant response; and 3) because dry farmed land needs to rest and recover, grains are not usually planted every year but instead the land is grazed and/or fallowed for several years in succession (Kelly 5-7). The Duarte Site met the second consideration.

"Third, the resumption of agricultural production in areas laying fallow as part of a normal rotational cycle are considered to be part of an established operation and would be exempted." The Duarte Site is an ongoing agricultural operation involving cattle grazing/dryland

wheat/fallow in a rotational cycle as has been discussed above, and therefore the resumption of planting to dryland wheat is an exempt agricultural activity.

The EPA memo goes on under consideration 3 to say*: "However, if a wetland area has not been used for farming for so long that it would require hydrological modifications (modifications to the surface or groundwater flow) that would result in a discharge of dredged or fill material, the farming operation would no longer be established or ongoing."* The Corps of Engineers in 33 CFR § 323.4 states it this way: *"An operation ceases to be established when the area on which it was conducted has been converted to another use or has lain idle so long that modifications to the hydrological regime are necessary to resume operations."* The preparation of a seed bed for planting of wheat was normal farming within an ongoing cycle of agricultural operations on the Duarte Site; it was not a conversion of use. The land had not lain idle—it was being grazed within an ongoing agriculture rotational cycle. Finally, modifications to the hydrological regime were not necessary to resume operations in the growing of dryland wheat (nor were significant modifications made to the hydrological regime—the Lee Team's assertions to the contrary are discussed in other portions of this report).

The Duarte Site met all three considerations listed for determining if the agricultural exemption applied. It should have been exempt from need for a permit for the tillage activity that occurred in 2012.

Recapture clause in Clean Water Act (CWA) Section 404(f)

Section 404(f)(2), the recapture of jurisdiction clause in the CWA's rules for agricultural activity exemptions says: *"Any discharge of dredged or fill material into the navigable waters incidental to any activity having as its purpose bringing an area of navigable waters into a use to which it was not previously subject, where the flow or circulation of navigable waters may be impaired or the reach of such waters be reduced, shall be required to have a permit under this section."* The Duarte Site does not fall within the recapture criteria because the landowner undertook the tillage operation as part of normal farming activity in rotation with livestock grazing, and not for the "purpose of bringing an area of waters into a use to which it was not previously subject". In our opinion, this cannot be viewed as an intentional conversion of land use.

Landform and Reference Areas Comparison

The Expert Team selected 'Reference Areas' (which they named 'CCCA Area 13' and 'CCCA Agricultural Area') away from the Duarte Site to forge most of their opinions about impacts of tillage on Duarte. The value and validity of the "Hydrogeomorphic" (HGM) assessment procedure presented in the Lee Report is predicated upon the landscapes, soils, and landforms among the Reference Areas that they selected and the Duarte Site being comparable and here we show that they are not at all comparable and thus the basis for the entire HGM assessment is faulty and must be set aside. Figure V-5 on page 60 of the Lee Report shows that only a small percentage of the Duarte Site, that part along the southern boundary, has “similarly situated vernal depression and swale complexes” that mimic the offsite “Reference Sites” (Area 13 and Ag Area, Lee Report, Appendix B, pages 1 and 2) . For the results of their HGM to be valid and useful, the design of the HGM assessment requires that landforms and landscapes of the Duarte Site must be substantially the same as those of the Reference Sites, according to the Expert Team’s “logic” as set forth in part III, pages 4 and 5 of their Appendix D that sets out the conventions for use of the HGM.

The hydrologic soil group (HSG) is a very effective way to broadly categorize landscapes in relation to watershed hydrology. The criteria for HSG is seen in Figure 8 and the NRCS (Soil Data Viewer) map of HSG is shown In Figure 9. This categorization of soils is widely used by hydrologists to forecast regional runoff for designing flood control structures and other facilities such as recharge basins, erosion control structures, and for outlining erosion control practices on the farm. In this case it is also useful in analyzing whether the Reference Sites are like soils on the Duarte site.

Table 7–1 Criteria for assignment of hydrologic soil groups when a water impermeable layer exists at a depth between 50 and 100 centimeters [20 and 40 inches]

Soil property	Hydrologic soil group A	Hydrologic soil group B	Hydrologic soil group C	Hydrologic soil group D
Saturated hydraulic conductivity of the least transmissive layer	>40.0 μm/s (>5.67 in/h)	≤40.0 to >10.0 μm/s (≤5.67 to >1.42 in/h)	≤10.0 to >1.0 μm/s (≤1.42 to >0.14 in/h)	≤1.0 μm/s (≤0.14 in/h)
	and	and	and	and/or
Depth to water impermeable layer	50 to 100 cm [20 to 40 in]	50 to 100 cm [20 to 40 in]	50 to 100 cm [20 to 40 in]	<50 cm [<20 in]
	and	and	and	and/or
Depth to high water table	60 to 100 cm [24 to 40 in]	60 to 100 cm [24 to 40 in]	60 to 100 cm [24 to 40 in]	<60 cm [<24 in]

Table 7–2 Criteria for assignment of hydrologic soil groups when any water impermeable layer exists at a depth greater than 100 centimeters [40 inches]

Soil property	Hydrologic soil group A	Hydrologic soil group B	Hydrologic soil group C	Hydrologic soil group D
Saturated hydraulic conductivity of the least transmissive layer	>10 μm/s (>1.42 in/h)	≤10.0 to >4.0 μm/s (≤1.42 to >57 in/h)	≤4.0 to >0.40 μm/s (≤0.57 to >0.06 in/h)	≤0.40 μm/s (≤0.06 in/h)
	and	and	and	and/or
Depth to water impermeable layer	>100 cm [>40 in]	>100 cm [>40 in]	>100 cm [>40 in]	>100 cm [>40 in]
	and	and	and	and/or
Depth to high water table	>100 cm [>40 in]	>100 cm [>40 in]	>100 cm [>40 in]	>100 cm [>40 in]

Figure 8 – USDA, NRCS National Ingineering Handbook tables showing the criteria for classifying of hydrologic soil groups when a water impermeable layer exists at a depth of 50 to 100 cm.

The assumption that the Reference areas are on a similar landform and landscape as the Duarte Site holds for perhaps 25% or less of Duarte. That is, the Reference Sites selected by the Team of Experts are entirely on the Red Bluff Formation with its unique soils, landscapes, microtopography and associated features …but only less than about 25% of the Duarte Site is underlain by the Red Bluff. The Expert Team has no proper analog for the 75% or so of the Duarte Site that is underlain by the much younger Riverbank Formation and still younger small remnants of the Modesto Formation and modern riverwash. This calls into question the value of the entire HGM assessment procedure of the Expert Team for more than 75% of the Duarte Site.

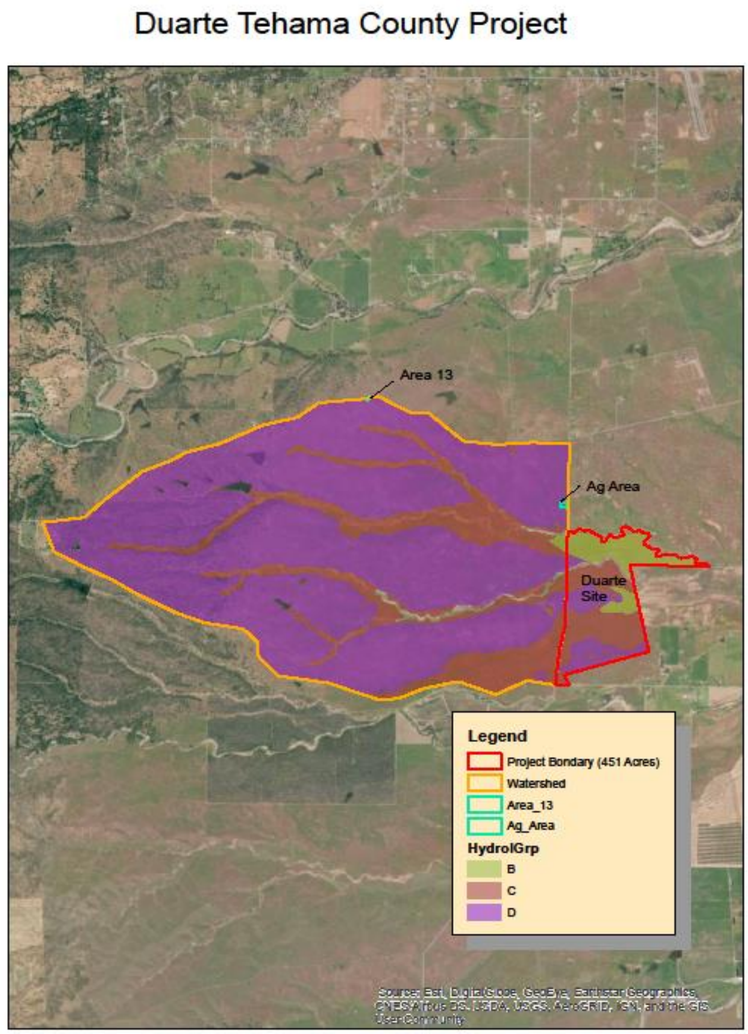


Figure 9 - Hydrologic soil groups (note the Reference Areas CCCA Area 13 Reference Site at the very top edge of the watershed).

To restate, the two dominant geologic formations that underlie the majority of the Duarte Site have distinctly different landforms that are naturally, physically, and functionally different, yet the Expert Team selected Reference Sites that only mimic the less extensive of the two, so the assessment rationale is flawed. Durixeralfs and Palexeralfs associated with the Red Bluff Formation function very differently than the Haploxeralfs associated with the Riverbank Formation. Soils occurring on the Red Bluff Formation on the Duarte Site are members of hydrologic soil group D, and the soils on the Riverbank Formation are members of HSG B and C.

Landforms in Relation to Reference Sites

The Team of Experts showed that eight Assessment Locations are on areas mapped as "similar" to the Duarte Site, while twenty-three are "dissimilar" (Lee Report Figure V-5). The Team of Experts also assumed the Duarte Site was "pristine" prior to 2012, but our examination of historic aerial photographs shows that the Duarte Site has been farmed at least since 1979. We discussed the importance of this oversight by the Team above in the section titled 'Farming History of the Duarte Site and Surrounding Lands'.

The Team of Experts in the Lee Report compare the Duarte Site to their 'Reference Areas', that is to their CCCA Area 13 and to their CCCA Agricultural Area, but as we will show here, that this is an incorrect comparison. One hundred percent of the wetlands in their Reference Areas are on the Red Bluff Formation with a distinctive, ancient landscape and soils, whereas about seventy-five percent of the area with "wetlands" evaluated on the Duarte Site are on a different and much younger geologic formation, the Riverbank, which has a very different landscape and *very* different soils.

The Red Bluff Formation is characterized by soils classifed in Soil Taxonomy (Soil Survey Staff, 2014) as *Abruptic Durixeralfs* (the Redding Series), *Typic Palexeralfs* (the Corning Series) and *Ultic Palexeralfs* (the Red Bluff Series). The Riverbank Formation is characterized by soil classified as *Typic Haploxeralfs* (Arbuckle) and *Mollic Haploxeralfs* (Perkins). In fact, the actual wetlands associated with the Redding and Corning soils are affiliated with inclusions of other soils.

The Lee Report, erroneously states (Page 117, 2. Summary of Hydrologic Observations of Depressions, Swales and Streams on the Duarte Site) that: *"…the two sites occupy the same landform, have similar hydrologic processes and are similarly situated in the regional landscape [as the Duarte Site] …"*. This is a stunningly incorrect assertion that casts a dark shadow over virtually all the field work they did, all the 'modeling' they did, and all the conclusions they reached. Simply speaking, it contradicts the published geologic mapping by Helley and Harwood (1985), the compilation map of Blake et al. (1999), and the soil survey maps of Gowans (1967). The Lee Report provides none of its own geologic or soils mapping to substantiate that the two 'Reference Areas' are "similar" to the Duarte Site.

The major components of soil map units (SMUs) AvA, Aw, PkA, PkB, CyB and Rg from the maps of Gowans are not hydric soils, but the SMUs allow for up to two to seven percent of unnamed hydric soils components. Wetlands within the major SMUs are supported by unnamed inclusions of hydric soils, usually these are soils with heavy clay textures such as seasonally saturated Xeric Duraquerts, Duraqualfs or Epiaqualfs. None of the unnamed minor inclusions were classified at any of the study sites of the Team of Experts, neither on their 'Reference

Sites' or those on the Duarte Site, in order for them to make scientifically valid comparisons of hydrologic function.

The streams themselves, Coyote Creek and streams 1, 4 and 8, originate off the Duarte Site with a reach of several miles (Lee Report Figure IV-2). The through-flowing streams such as Coyote Creek are ever changing and may scour or deposit erosional materials depending on the energy of the system in any given storm event. Some storms may not be powerful enough to move materials, or they may deposit materials, others may be strong enough to scour. These streams were mapped as "Riverwash", non-soils, and no data for this miscellaneous land type, is populated in the National Soils data base, the National Soil Information System (NASIS).

In addition, both 'swales' on the Experts Reference Site are at the very uppermost headwater portions of their local watersheds with essentially zero stream reach (Lee Report Figure IV-2; Figure 9, this report) and thus have almost no water-gathering area, whereas swales on the Duarte Site have a longer fetch and a steeper down-sloping thalweg through soils with no mapped restrictive layers (Perkins and Arbuckle Series).

Both "Reference Sites" (Area 13 and Ag Area) have a very limited watershed above it and each amount to at most 2 acres of area to collect runoff above the assessed wetlands, yet the monitoring sites are recording ponding or very shallow groundwater in the wet seasons of 2013, 2014 and 2015 (Lee Report, Pages 11-15). In contrast, the Duarte Site is near the center of a much bigger local watershed, with 4,464 acres upstream of the west property boundary. Field Data Sheets record no groundwater levels within 12 inches of the surface at the same time the Reference areas are saturated in the upper parts of the profile or are ponding. To judge by the huge difference in catchment area for ponding and pooling of water in ephemeral streams and swales alone, the Reference Sites are in no way comparable to the Duarte Site in terms of drainage size or position and offsite inflow from tributary streams, yet they are saturated or ponding. Size and position of the Duarte site, if comparable to the Reference sites, would be much wetter from runoff and sediment inflows from several miles of roadside ditches along Paskenta Road (Lee Report, Fig IV-2, page 33; Figure 9, this report).

Hydrogeomorphic (HGM) analyses of functioning of waters/wetland ecosystems

The Team of Expert's HGM Functional Assessment Guidebook is presented in Appendix D along with their HGM scoring forms for the CCCA Reference Areas and "*by inference the Duarte Site*". Their conclusions from HGM assessment are covered in pages 99-102 and 143-149 of the Lee Report.

They developed assessment procedures specifically to address the Coyote Creek and Oat Creek Watersheds with a model design predicated on: (a) geologic formations old enough for substantive pedogenic processes to have occurred to form clay-rich and/or argillic horizons or duripans that support perched surface water and (b) classes of waters/wetlands (e.g. high terrace slopes (swales) and depressions, small streams, Coyote Creek), which they aggregate together to view as similarly situated landscape units.

In our opinion the model's overall premise is flawed because the CCCA Reference Area and the Property don't share the same soil-geomorphic landscape (as previously discussed), so it's an "apples-to-oranges" comparison. But even if we were to look past their misjudgment about sameness for comparing the two areas, there are several technical problems with the Expert Team's inconsistent and inaccurate scoring of HGM variables that question the validity of the Team's overall assertion that: *"Degradation of functions is shown by the HGM assessments mainly because tillage operations significantly [and permanently] impacted fundamental hydrologic and soil conditions on the site."* (Lee Report, page 143). They base their claim of *significantly degraded or destroyed physical, chemical, and biological functions within the streams and wetlands on the Duarte Site after the late 2012 tillage activities* on HGM polar plot graphic comparisons of their pre- and post-tillage modeled estimates of site functioning (Lee Report pages 145-147). Examples of inconsistent and inaccurate scoring (the scored sheets are shown in Appendix D):

HGM Score Sheet for Depressions & Slopes Buffer Condition Variable (high and low terrace positions). The CCCA Ag Area is scored 0.75 because of *plowing, disking, harrowing, or raking with no fractured restrictive layers*, but the Duarte Site is scored 0.50 due to *plowing, disking, harrowing, or raking with disrupted shallow permeability layers*? How is this inconsistency possible since both sites were likely treated (e.g., tilled) in similar ways for the same purpose? But they say shallow tillage at CCCA Ag Area had zero impact while at the same time permanently disrupting or destroying restrictive layers at the Duarte? NRCS mapping indicates that restrictive layers don't even exist under most of the Duarte Site to be destroyed by shallow tillage. And the CCCA Reference Area is mapped as underlain by shallow claypan/duripan soils but the Expert Team has judged no impact from shallow tillage of the past! It is completely illogical. Further, the Expert Team provides no site-specific soil descriptions or photographs containing adequate data as evidence to verify their presumption of fractured layers under the Duarte Site. Instead, they self-admittedly base their HGM scoring primarily on their "field observations and best professional judgement". Their scoring in this example is unsound and unreliable in our opinion.

HGM Score Sheet Depressions & Slopes Buffer Continuity Variable (high and low terrace positions). In this case, the measurement standard in the HGM Guidebook is flawed. It defines buffer continuity as the distance around the wetland/water edge that is bounded by intact buffer. But "intactness" is not defined anywhere. Is intactness measured by amount of vegetative canopy cover, and if so, what is the threshold (100%, 50%, or what)? Or, does intactness include (in full or part) residue cover, surface rock fragment cover, and surface roughness? All these should matter if run-on of sediment/nutrients to the wetland is the functional concern they are thinking about. But we have no way of knowing what intactness means, or what they measured when they placed a scored this variable. We only know that they used their best professional judgment, and since their measurement standard is incomplete, their determination can't be replicated by a peer for verification.

Looking at how the Lee Team scored the two Areas under this variable, we find the CCCA Ag Area scored at 1.0, but the Duarte area at 0.1 (four index groups lower than CCCA Ag Area). The Expert Team apparently viewed the CCCA Ag Area as having returned to 100 percent intact following the past surface tillage there, but the Duarte Site only 0 to <25% intact following the surface tillage in 2012. In order to test this, we assume that they used vegetative cover as the measure of intactness when they applied their professional judgment. It seems improbable to us that only 0 to 25 percent vegetative cover had returned around the waters/wetland edge in this setting after nearly 2.5 years since the tillage event, and viewing the following Google Earth images taken March 15, 2015 (two months prior to dates listed on the Expert Team's scoring sheets) it appears that vegetative growth had recovered on the Duarte Property to a greater degree than is indicated by the Expert Team's HGM scoring. The Duarte Site and the CCCA Area look to both have well-established cover in this aerial view.

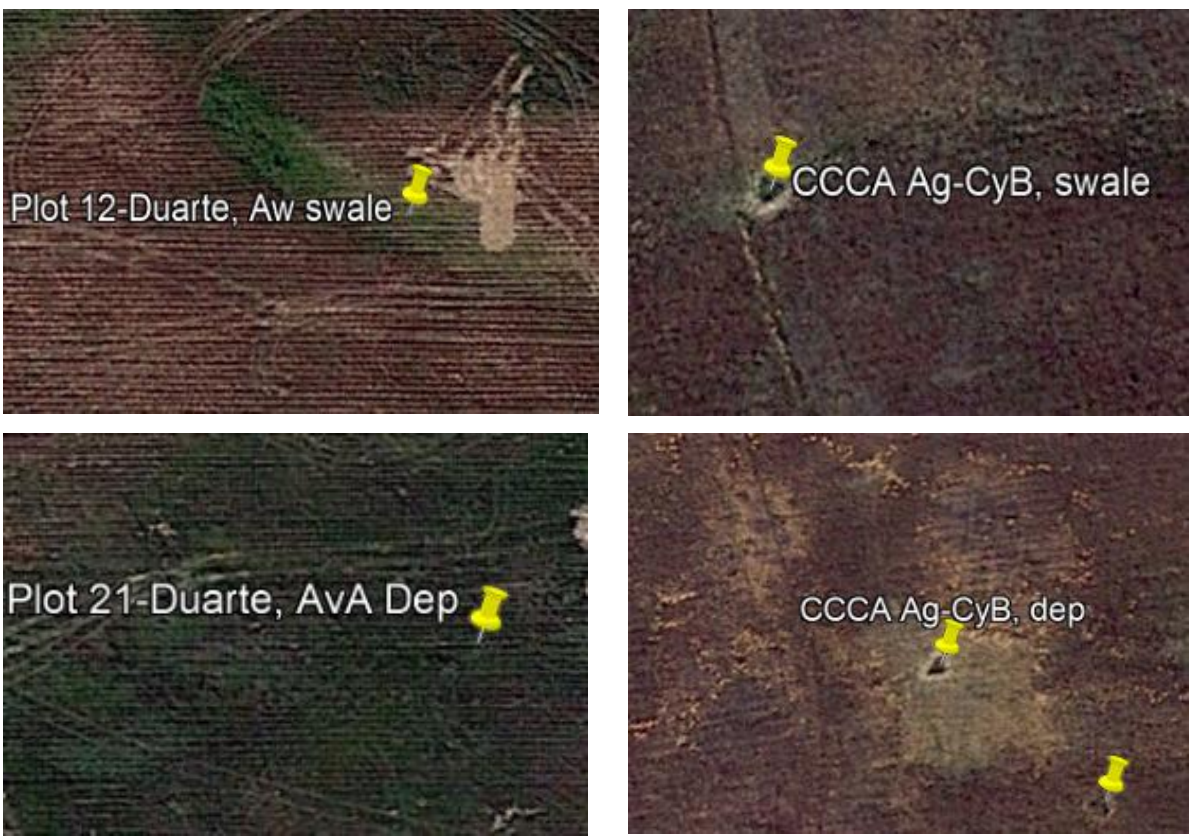


Figure 10 – Comparison of vegetative cover and tillage features in 2105 aerial images of the Duarte Site and CCCA Ag Area Reference sites.

Also note that the same pattern of tillage furrows is evident on both the Duarte Property and the CCCA Agricultural Area Plots. The images are at about the same scale and the tillage furrows appear to be roughly the same height and spacing apart. The vegetative recovery also looks comparable when you consider only about 2.5 years since tillage at the Property, but apparently many years since the CCCA Agricultural Area was tilled with surface tillage pattern still visible. Still, the DOJ Team's HGM assessment has judged ecological functioning on the Duarte Property to be permanently degraded or destroyed, while the CCCA Agricultural Area is assessed as being relatively intact. That is illogical.

The ground level photo shown in Figure 11 was taken by the Expert Team on April 7, 2015 on the Duarte property (Photo F19, Appendix F). Their report contains numerous other photos showing well established vegetation in 2015 as well. Their documentation verifies that the vegetation has recovered to greater than 0 to 25 percent cover overall on the Property. The wide difference in Buffer Continuity Variable scoring assigned between the areas by the DOJ Team seems entirely unjustified. We're left wondering about the Lee Team's scoring of this and other HGM analysis variables?

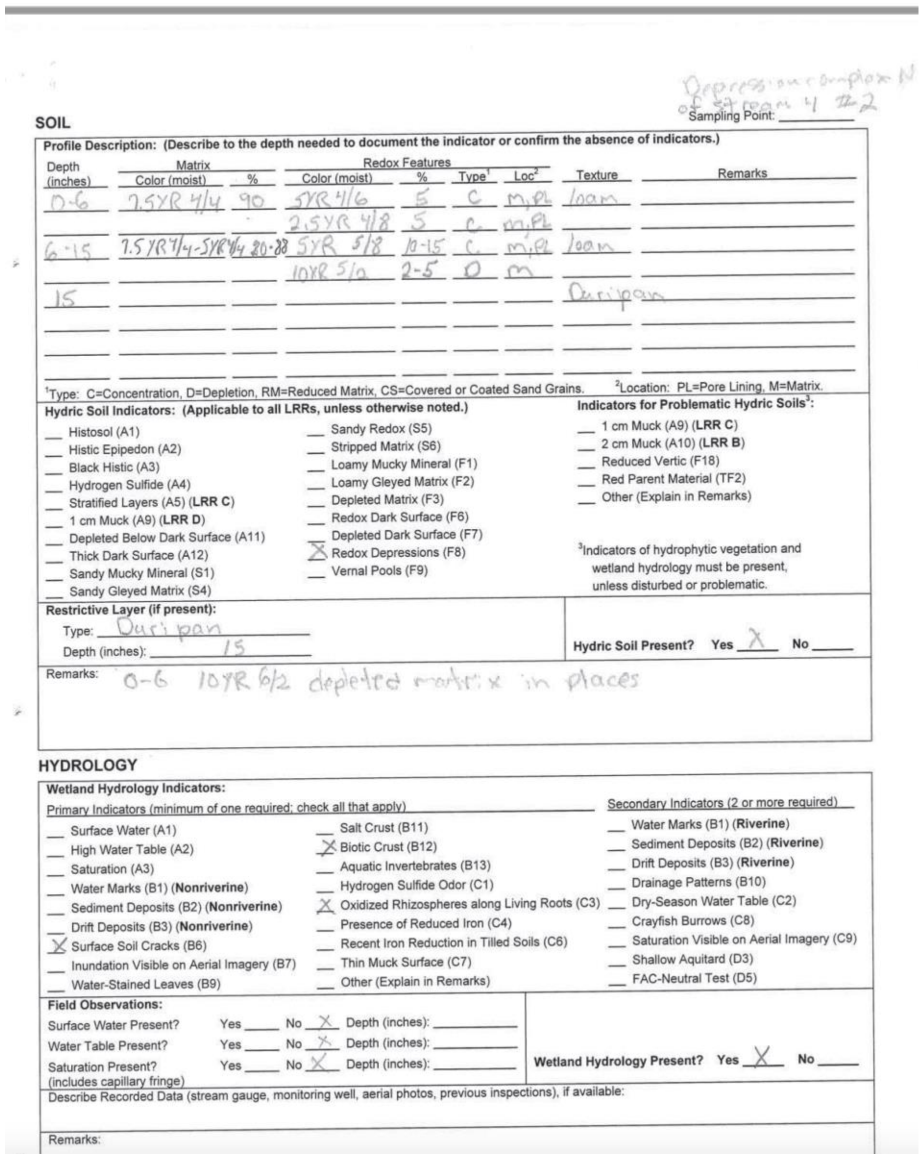
Figure 11 – An example of representative vegetative cover for assessing buffer contituity at Duarte Site in March 2015.

We've documented several other examples of inconsistent or inaccurate use of the HGM assessment scoring by the Expert Team and other technical questions about the model's measurement standards. It is our opinion that the Expert Team's comparisons of polar plots of hydrogeomorphic wetland functions and their overall conclusions about kind and extent of degradation of wetland functions on the Duarte Property are unsound and unreliable.

Data Collection

The Team of Experts' Field Data Sheets (Appendix A) record surface vegetation, soil colors and textures to a depth of about 12 inches. They attempt to find evidence of wetland hydrology by using surrogate soil indicators as opposed to direct measurements of groundwater. The plant species records of the Expert Team, at least, appear reasonable; however, several aspects of the soil information, including colors recorded and the interpretation of the origin (redoximorphic features of other pedogenic soil features or inherited paleosol fragments) are open to question and alternative interpretations.

First, on their Field Data Sheets, all the soil colors noted after the matrix color for each soil horizon was *prima facie* assumed by Team of Experts to be caused by redoximorphic processes, that is, to be hydric soil indicators. In our experience, soils on these and similar landforms in the Sacramento Valley are polygenetic (Busacca, 1982; Busacca Singer and Verosub, 1989). What this means is that older deposits and the soils that were formed on their surfaces were cannibalized by stream erosion so that these polygenetic and mixed materials along with fresh mineral sediments form 'parent materials' that can have been recycled 3, 4, and 5 times or more over the late Pliocene through the Pleistocene and the Holocene. In this situation, the 'parent materials' of any soil are partly to dominantly eroded soil sediment from incision of older terraces that is laid down into a new alluvial deposit where colors and features (fragments of peds, fragments of clay films, fragments of duripans, lithic volcanic fragments, etc.)



SOIL

Sampling Point: Depression complex N of stream 4 #2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 4/4	90	5YR 4/6	5	C	M,PL	loam	
			2.5YR 4/8	5	C	M,PL		
6-15	7.5YR 4/4-5YR 4/4	80-88	5YR 5/8	10-15	C	M,PL	loam	
			10YR 5/2	2-5	D	M		
15							Duripan	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR C**)
__ 1 cm Muck (A9) (**LRR D**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
__ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
X Redox Depressions (F8)
__ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR C**)
__ 2 cm Muck (A10) (**LRR B**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: Duripan
Depth (inches): 15

Hydric Soil Present? Yes X No ____

Remarks: 0-6 10YR 6/2 depleted matrix in places

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
__ Saturation (A3)
__ Water Marks (B1) (**Nonriverine**)
__ Sediment Deposits (B2) (**Nonriverine**)
__ Drift Deposits (B3) (**Nonriverine**)
X Surface Soil Cracks (B6)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
__ Salt Crust (B11)
X Biotic Crust (B12)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
X Oxidized Rhizospheres along Living Roots (C3)
__ Presence of Reduced Iron (C4)
__ Recent Iron Reduction in Tilled Soils (C6)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

__ Water Marks (B1) (**Riverine**)
__ Sediment Deposits (B2) (**Riverine**)
__ Drift Deposits (B3) (**Riverine**)
__ Drainage Patterns (B10)
__ Dry-Season Water Table (C2)
__ Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
__ Shallow Aquitard (D3)
__ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Figure 12 - Example Wetland Determination Data Form from Appendix A of Lee Team Report.

are inherited and incorporated as a new soil develops. Thus, it is far from a simple matter to discriminate between contemporary redoximorphic features and inherited fragments and features and materials. And this difficulty is magnified greatly in the subject soils because the matrix colors themselves are very red in Munsell soil color hues of 2.5YR, 5YR, and 7.5YR.

As a case in point in Figure 12 we highlight one Wetland Determination Data Form (WDDF), specifically the 'Soil' and 'Hydrology' field notes for the DOJ Site 18 on Duarte (Lee Report, Appendix A). Two horizons are described, the first from 0"-6" and the second from 6"-15". In the first horizon, a moist matrix color of 7.5YR 4/4, 90%, is described as hosting 5% each of redox concentrations with moist colors of 2.5YR 4/8 and 5YR 4/6. In the second horizon, a moist compound matrix color of 7.5YR 4/4 and 5YR 4/4, 80-88%, is described as hosting 10-15% redox concentrations with moist color of 5YR 5/8 and 2-5% redox depletions with moist color of 10YR 5/2.

No other pedogenic features are noted in the description of site 18 and in fact in the entire set of dozens of such descriptions from both the Duarte Site and from the Reference Sites, only in a very few of them is there any mention made of mixing or inherited materials with red colors, or even of such common features in these soils as clay films (coatings of translocated pedogenic clay on mineral grains or peds). Yet a photograph of a hand sample from the surface soil of Site 18 that they used in 2 places in the appendices of the Lee Report shows to us clear evidence of the error or omission, from their soil description, of clay coated peds with 2.5YR or 5YR Munsell hues.

Photo F41 from DOJ Appendix F (shown as our Figure 13) is of the surface horizon from site 18 and the caption says, verbatim: "Photo F41. Mixed soil horizons due to tillage at Location 18 showing a thin veneer of sediment (3mm) and fragments of subsurface horizons present in the surface horizon." Yet the official record of the observations of the soil scientist on the Expert Team, the WDDF soil description of Site 18, fails to record any of this critical information about the character of the surface horizon, or of any mixing, or of fragments of material from deeper horizons in that sample, instead simply ascribing a single matrix color and 2 colors asserted to be simply of redoximorphic concentrations.

And to highlight possible confusion on the part of members of the Expert Team as to how to correctly discriminate redoximorphic features from the many alternative kinds of 'spots of color' in these soils, in Appendix C of the Lee Report, the Experts use the very same photo to illustrate that this sample is representative of a 'hydric soil'. Which caption to the same photograph used in different appendices is the correct one?

We totally concur that the photo F41 shows "fragments of subsurface horizons". In fact, the dominant contrasting color to that of the matrix is intense red clay coatings on peds with no clearly visible redoximorphic concentrations in the photo.

It is useful to note that peer-reviewed scientific journals regularly retract studies with this sort of photographic error.

We are further concerned whether the soil descriptions, and thus the hydric soils call for many of them, accurately interpret other soil colors and features. For example, on the WDDF for the soil at site 18 in the 0"-6" and the 6"-15" horizons are described areas of 'depleted matrix' with moist colors of 10YR 5/2 and 10YR 6/2. No apparent effort was made to rule out a different pedogenic feature, skeletans (which are soft masses and ped coatings of concentrations of

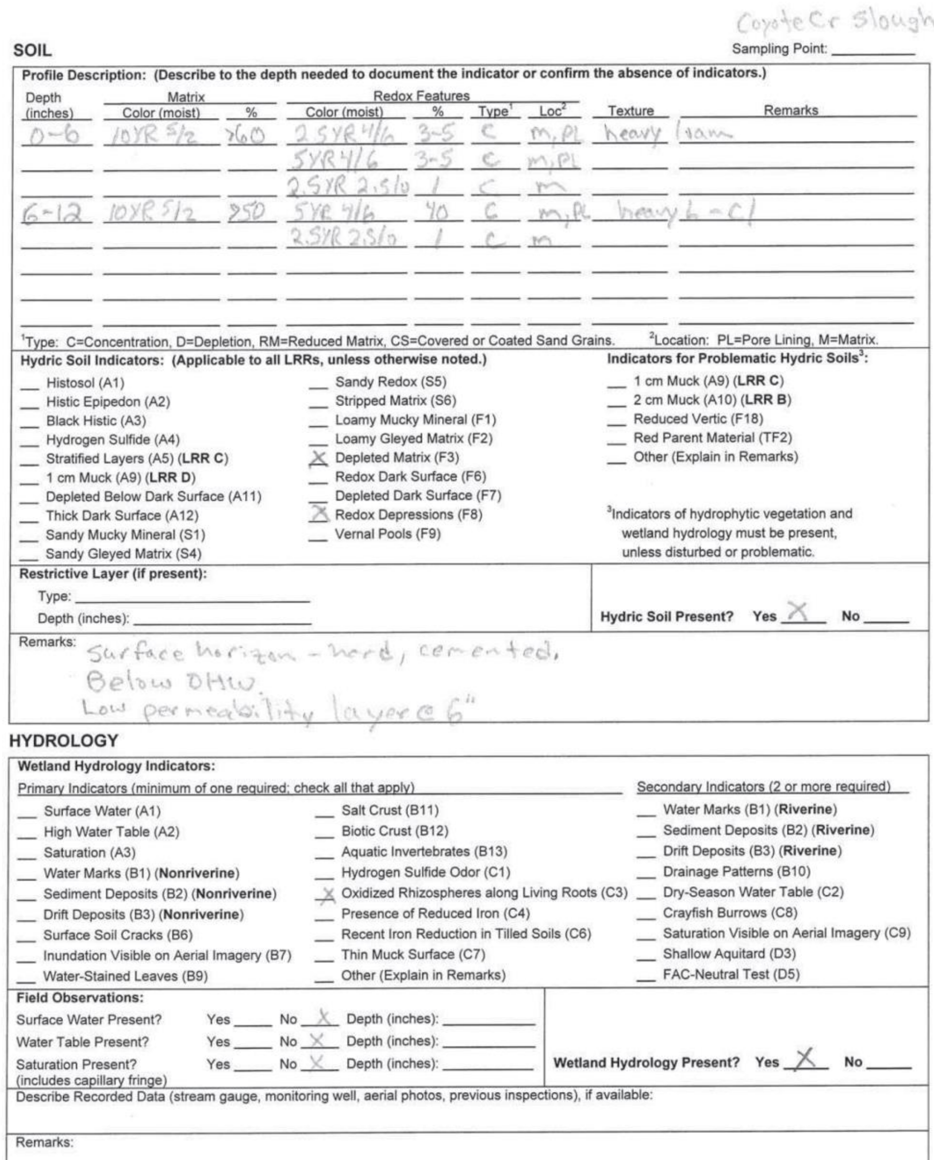
Figure 13 – Example of clay coated peds with 2.5YR or 5YR Munsell hues that the Team of Experts failed to record.

Photo F41. Mixed soil horizons due to tillage at Location 18 showing a thin veneer of sediment (3mm) and fragments of subsurface horizons present in the surface horizon.

clean, white sand and silt grains that result from translocation of iron oxide coated clays out of and away from parts of the soil matrix thus leaving behind masses of colorless quartz and white feldspar grains). Skeletans have been commonly observed in soils formed on the Riverbank and Red Bluff Formations in the Sacramento Valley (Busacca, Singer, and Verosub, 1989).

We highlight a second use of depleted matrix in the Lee Report in Figure 14. The soil description on the WDDF of site 22 in Appendix A of the Lee Report highlights what we believe to be a wholly incorrect use of 'Depleted Matrix (F3) to make a hydric soil call: The matrix color (>60%) of the 0"-6" layer is recorded as 10YR5/2 moist. In a 'slough' setting this is an entirely predictable normal moist A-horizon color in this environmental setting and climate. Yet this same normal A-horizon matrix color is used to check 'F3 Depleted Matrix' and the soil is determined by the Team of Experts to be a hydric soil.

Related to this is what we believe to be a wholly incorrect use of the 'F8' indicator: 'Redox Depressions'. The definition of this indicator in USDA (2010) states "In closed depressions subject to ponding…" yet this site, site 22, according to the WDDF filed by the Expert Team is in 'Coyote Creek Slough', which by definition is not a closed depression.



Coyote Cr Slough

SOIL Sampling Point: ______

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/2	>60	2.5YR 4/6	3-5	C	m, PL	heavy	loam
			5YR 4/6	3-5	C	m, PL		
			2.5YR 2.5/0	1	C	m		
6-12	10YR 5/2	≥50	5YR 4/6	40	C	m, PL	heavy	L-C/
			2.5YR 2.5/0	1	C	m		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR C**)
__ 1 cm Muck (A9) (**LRR D**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
X Redox Depressions (F8)
__ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR C**)
__ 2 cm Muck (A10) (**LRR B**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: ______
Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks: Surface horizon - hard, cemented, Below OHW. Low permeability layer @ 6"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
__ Saturation (A3)
__ Water Marks (B1) (**Nonriverine**)
__ Sediment Deposits (B2) (**Nonriverine**)
__ Drift Deposits (B3) (**Nonriverine**)
__ Surface Soil Cracks (B6)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
__ Salt Crust (B11)
__ Biotic Crust (B12)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
X Oxidized Rhizospheres along Living Roots (C3)
__ Presence of Reduced Iron (C4)
__ Recent Iron Reduction in Tilled Soils (C6)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

__ Water Marks (B1) (**Riverine**)
__ Sediment Deposits (B2) (**Riverine**)
__ Drift Deposits (B3) (**Riverine**)
__ Drainage Patterns (B10)
__ Dry-Season Water Table (C2)
__ Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
__ Shallow Aquitard (D3)
__ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ___ No X Depth (inches): ______
Water Table Present? Yes ___ No X Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ______

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Figure 14 – Duarte Site WDDF 22 from the Lee Report.

Our review and comment on just three of the many soil descriptions in Appendix A of the Lee Report casts into serious question whether these soils are in fact hydric soils, AND it casts concern of more weaknesses or errors in hydric soil calls for many, perhaps most soils on the Duarte Site.

A related issue is our objection to the use of soil features to infer wetland hydrology. We assert that the correct identification of 'oxidized rhizospheres of living roots' is almost impossible given the occurrence of tremendously intense red 2.5YR, 5YR, and 7.5YR soil matrix colors of surface horizons in many of the soils in swale locations. That is, even with a hand lens we do not agree that reddish oxidized haloes around roots can consistently and correctly be seen in such intense red soil matrices. Yet the Expert Team relied consistently on oxidized rhizospheres as a Primary Hydrology Indicator.

Presence of reduced iron (C3), another Primary Hydrology Indicator requires the chemical test with alpha, alpha-dipyridyl. This method also requires a saturated environment, which is not documented on any of the Field Data Sheets. Groundwater is identified mainly below 12 inches depth, outside the criteria for wetland hydrology.

The calculations for dominance in determining hydrophytic vegetation uses Atypical Conditions, essentially allowing for almost any plant assemblage to qualify as Hydrophytic; the F8 Hydric Indicator for a hydric soil is inappropriately applied to swale morphology (it is unusual to list up to four different redox color features); and hydrology is mainly based on a surrogate soil indicator "oxidized rhizospheres" that could easily be mistaken for clay films in matrix colors of 7.5YR 4/4 and 4/6 or redder. There is no description of clay films offered by the Team of Experts. Absent a water table above 12 inches depth, the C3 hydrology indicator is impossible to evaluate.

While the authors state that "Atypical Conditions" exist, there is no indication on any of the Field Data Sheets that wetland indicators - wetland hydrology, soils, vegetation or a combination of the three had been removed. Every Data Sheet determined to be wetland had all the "yes" boxes checked. Where loss of wetlands might occur, one would expect indicators to be missing.

Even though the Field Data Sheets (WDDF) in wetland areas had three of three indicators marked "yes", there are issues with those interpretations. The indicator F8 Redox Depression (USDA), criteria specifically for closed depressions subject to ponding, is ubiquitously and in our opinion incorrectly utilized by the Expert Team as a hydric indicator in through-flowing swales, sloughs and streams. One such example is in Appendix C, page 15 (Assessment Location 22), where Slough 2 is characterized as a wetland as "connected to Coyote Creek", however bed-bank stream morphology appears to be lacking and the F8 indicator is used for justification of Hydric soil. A slough is defined as a marsh, in this case with an outlet to Coyote Creek. Slough 2 appears to be other than a marsh, which typically displays mucky soils supporting vegetation such as *Typha* (sp), *Scirpus* (sp) and other obligates. Dominant vegetation identified by the Team of Experts at Slough 2 is characterized as *Lolium perenne* (Fac).

Other examples of the use of F8 that we believe to be incorrect can be seen in Appendix C, on page 46 (Assessment Location 12); on page 50, Assessment (Location 20); and on page 57, (Assessment Location 10). Nearly all the Wetland Delineation Data Sheets associated with swales or sloughs rely on the F8 indicator as justification for Hydric Soils to delimit wetlands.

The appropriate Hydric Soil Indicators for swales in practice are: F2, F3, F6, or F7, all of which require the presence of redoximorphic depletions. None of matrix colors in the photographs supplied by the Lee Report appear to be dark enough in color (numerically low enough chroma color or high enough values, moist) to qualify for Hydric soils. The matrix colors of the soils at the sites named above have values and chromas too light or bright, respectively, to qualify as hydric soils using the definitions in the F2, F3, F6 or F7 indicators. Our review of the 31 Data Sheets on the Duarte Site shows that 26 of them would fail to meet the matrix or redox color for the F2, F3, F6 or F7 hydric soil indicators to be considered hydric soils. Three sites (8, 28, 29) have no data presented.

The true measure of hydrology is measuring the water table at the time of assessment or to install recording monitoring wells. The Reference Areas (Area 13 and Ag Area), depressions and streams, were monitored over the period from November 2012 through June 2015. At the time of field examination across all sites, the Reference Areas and the Duarte, the Reference Area groundwater tables in the swales and depressions are showing either saturation or ponding between the months of November and May each year. Data sheet observations of the soils and the hydrology of the sites on the Duarte Site were all made in the month of April 2015. In this xeric (winter wet-summer dry, Mediterranean type) rainfall regime where typically 80% of the annual precipitation falls between November and May. Thus if wetland hydrology were present at these sites this mid-April period would be expected to perfectly capture high water table levels if they exist, yet the water table depths at the assessment locations of the Duarte Site that were recorded on the Wetland Determination Data Sheets in Appendix A of the Lee Report are either 'not observed' or deeper than 12" below the soil surface. And those sites for which a water table depth was reported range between 12" and 36", which are too deep to assert wetland hydrology.

The reports states: "There is evidence in the monitoring data of episaturation and occasional surface flow during precipitation events." (Lee Report, Appendix B, page 22). This may be true for the monitoring sites; however, groundwater tables were not seen in the swales evaluated on the Duarte Site in the upper part of the soil profiles. The standard interpretation from this data is swale hydrology is in line with hydrologic soil group (HSG) C, which is generally not associated with seasonal wetlands. The logical and procedurally correct interpretation then is that the study sites on Duarte lack wetland hydrology.

Jurisdictional Wetlands

In a cultivated field, such as the Duarte Site was after normal tillage practices, it is common for dislodged soil materials to find its way to the bottom of the furrow across the entire field after rain events. An example of this from an offsite location is shown in Figure 15.

Where hydrology in a farmed wetland is being assessed, indicators such as "water marks", "sediment deposits" and "surface soil cracks" need to be compared with what would be considered adjacent upland. If these same features are present in upland settings, they are inappropriate wetland indicators.

There are no direct measurements of saturation or standing water within 12 inches recorded on any of the data sheets in Appendix A of the Lee Report, which would be extraordinarily unusual for true wetlands in an early April determination period in a xeric climate, when the "Reference Areas" are showing saturation and ponding. There are also no comparison Field Data Sheets presented and no transect data that show differences between uplands and wetlands.

Figure 15 – An example of conventional tillage after rain storms.

Taken together, in accordance with standard interpretation and assessment, there is not one of thirty-one Site Assessment Locations advanced by the Lee Report on the Duarte Site in Appendix A that meets the minimum criteria for a jurisdictional wetland under the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (September 2008).

Altered Hydrology

The Lee Report does not document any changes in runoff or in hydraulic conductivity due to disruption of the subsoils that could be responsible for destruction of wetlands or change in water movement within or over the soils. None of the recorded observations of the Expert Team in the report or its appendices show penetration of restrictive subsurface argillic or duripan horizons by tillage equipment. They provide no physical evidence to support their claim that tillage tools pierced *through and beneath* subsoil restrictive layers to alter hydrologic performance, as is alleged on page 120. The Lee Report disclosed on page 114 that the surface tillage penetrated to 5 to 7 inches average depth and recorded tillage depth on field data sheets in Appendix A to typically only about 6 to 10 inches deep, but then made interpretations about damage to the subsoils that are unfounded. The Expert Team have no observations of any kind showing subsoils and related soil permeability being altered or damaged. In fact, it is physically impossible for damage to have occurred to restrictive clay rich and cemented subsoils that in most cases extend to many feet deep because of the shallow chisel plowing operations that occurred in 2012. The shallow depth of the descriptions recorded by the Expert Team should have precluded them making any conclusions about fracturing of subsoils on the Duarte site.

120

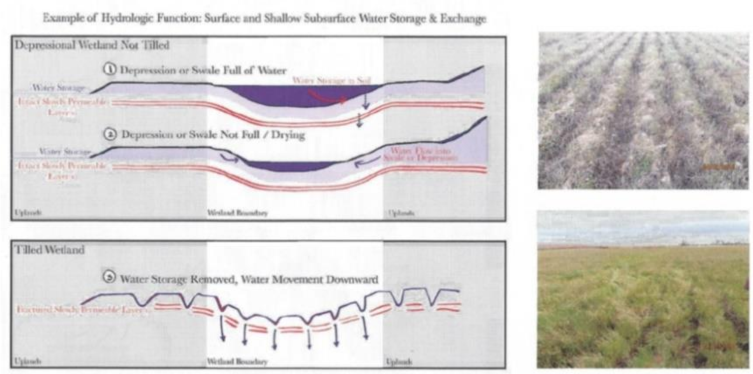


Figure 37. Schematic showing the impact of tillage across a depression or swale where the underlying slowly permeable soil layers are fractured. Water then moves downward in the soil profile rather than saturating surface soils, ponding on surface soils, or running off. The downward movement of water caused by tillage constitutes a significant change in the patterns of water flow and circulation within the depression or swale wetland. (Not to scale)

Figure 16 – Lee Report graphic illustrating water removal (unsubstantiated).

Figure 37 in the Lee Report (our Figure 16 shown here), is misleading: it suggests shallow tillage of the surface soil with tillage equipment will damage or destroy a restrictive subsoil horizon, making the soil more permeable. If that were true, the site would become less erosive, as infiltration would increase, runoff would decrease, and water quality would improve. That effect would be loss of wetlands. The soil profile features documented first for soils such as the Arbuckle, Perkins, Corning, Redding and Red Bluff series by Gowans et al. (1967), and subsequently documented on site by Butterworth (2015), are of soils with substantial dense argillic horizons and some also have strongly cemented duripans as well with massive, prismatic (indicative of high shrink-swell) or platy (impervious) soil structure to many feet such that the whole soil profile would have to be disrupted to greater than 40 inches depth to increase hydraulic conductivity in the upper part of the profile. A 5-to7-inch-deep tillage pass cannot possibly impart such profound changes.

To illustrate the point, below are profile graphics of the major soil types on the Duarte Site. These profile graphics are generated from NRCS SSURGO data linked by UC Davis Soil Laboratory in Google Earth Pro (accessed at: https://casoilresource.lawr.ucdavis.edu/). Note the thickness of the restrictive layers. The 7-inch tillage equipment documented in the Lee Report is incapable of reaching the upper boundary of the restrictive layer to make it more permeable, which is implied by the Expert Team's "Tilled wetland" illustration (Fig. 16, this report).

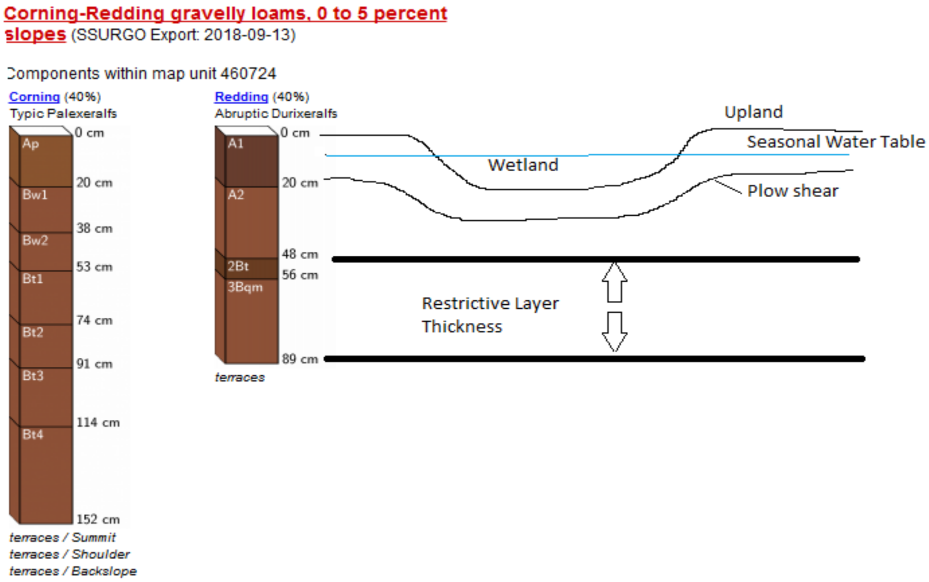


Figure 17 – Soil profile of Corning-Redding complex and horizon thickness fo restrictive subsoils (UCD Soil Laboratory projected in Google Earth).

A similar scenario is seen in the Arbuckle series, where the tillage would not have made it even into the upper boundary of the subsoil, let alone alter the nearly meter-thick dense clayey argillic horizon beneath the penetration depth of the plow. Wetlands or more accurately *alleged wetlands* considering the procedural errors in designating hydric soils and wetland hydrology highlighted earlier in our report, in fact remained intact after the tillage performed in 2012.

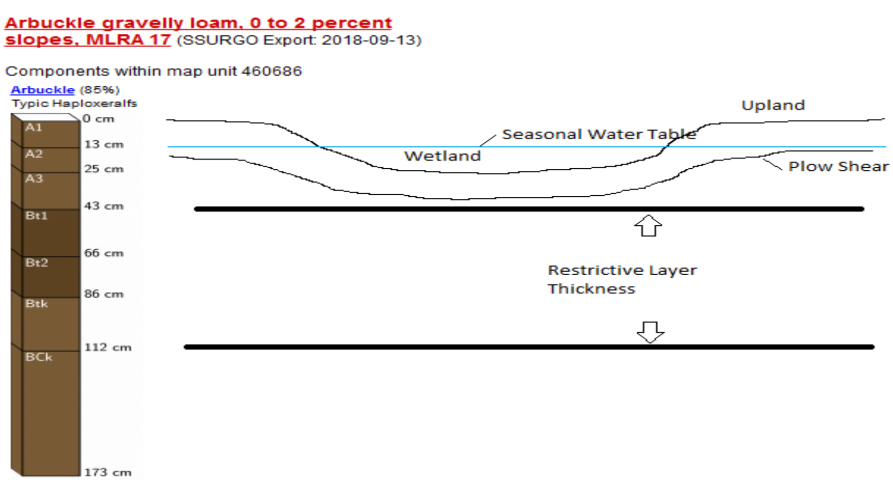


Figure 18 – Arbuckle soil series, clayey substratum phase schematic.

These diagrams track well with the descriptions of the named soil series in Gowens (1967). Note that a disclaimer on the SSURGO/STATSGO block diagrams presented by UCD says: “note that these diagrams may be from multiple survey areas”.

124

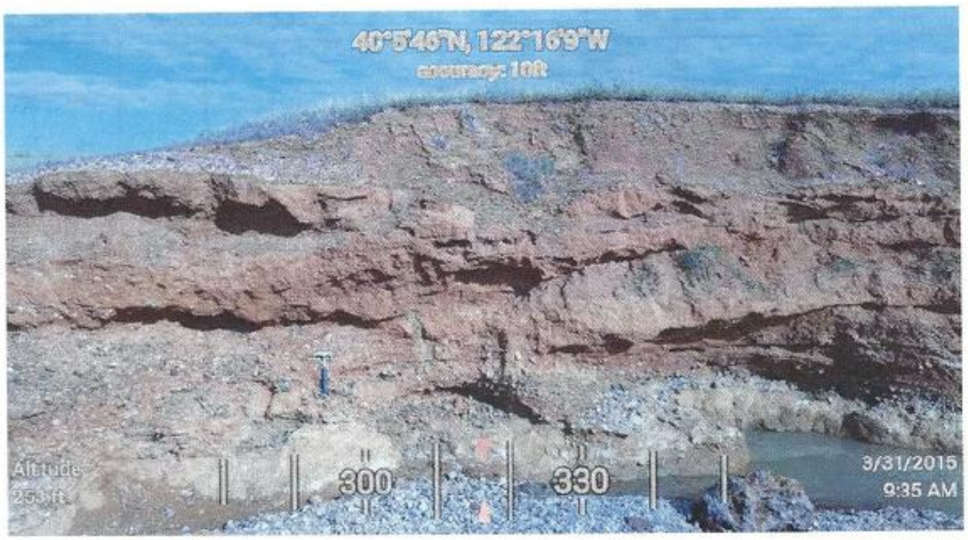


Photo V-3. Cut bank on Coyote Creek showing some of the original alluvial fan deposits, including the coarse-grained sediments that now form the coarse-grained lag deposits that are found in many of the stream reaches on the Duarte Site.

Figure 19 – Photo of the Red Bluff Formation (Lee, et al., 2015). Note the restrictive layers at depth and the relative thicknesses (12” rock hammer for scale). 7” of tillage would have no effect on profile hydrology.

Except for a single photo of a tillage fragment in one photo and a soil profile with no scale in a cutbank (Figure V-41 on page 127 of the Lee Report), the Team of Experts provided NO formal and complete onsite soil profile descriptions and no other evidence that tillage penetrated *through* any of the *restrictive layers* in the subsurface horizons of the Perkins, Arbuckle, Corning, Redding, or Red Bluff series soils or swale-associated soils in these landscapes. Further, the Experts did not make any comparative measurements of soil hydraulic conductivity to support their claim that tillage caused increased permeability (hydraulic conductivity) and irreversibly changed the hydrology.

Tillage practices on the Duarte property are not “consistent with deep tillage or deep ripping” is claimed in the Lee Report’s final Summary and Discussion. The Team of Experts say “*tillage operations on the Duarte Site [were] functionally the same as the deep-ripping”* observed when working on the Borden Ranch case. This is unsubstantiated.

By their own description *'deep ripping' requires a procedure in which four-to-seven foot long metal prongs are dragged through the soil behind a tractor or a bulldozer: [t]he ripper gouges through the soil restrictive layer, disgorging soil that is then dragged behind the ripper* (Lee et al. 155), and d*eep tillage is the practice of performing tillage operations below the normal tillage depth to modify the physical or chemical properties of a soil* (Lee et al. 154). Neither of those descriptions is in any way comparable to chisel plowing to an average depth of 5 to 7 inches or less with a six-shanked chisel plow in order to scarify the soil surface in preparation for aerial seeding of dryland wheat, as occurred in 2012 on the Property (Kelly 4).

It appears from some of the photos in the Lee Report that fragments of duripan may have been dislodged from shallow depth in the vicinity of the southwest corner of the property and appear at the surface, but there is no documentation showing that the restrictive layer had been pierced to a depth that would increase hydraulic conductivity of the soil profile.

In fact, in these ancient landscapes that have undergone several cycles of erosion and deposition in their history, it is not uncommon for fragments of polygenetic paleosols to occur within the modern solum. Butterworth (2015) confirms from backhoe pit description and photos that the duripan in the vicinity of the southwest corner is nearly 3 feet thick and his photos in his Exhibits C and D show what we recognize as two to four different ages of duripans with today's land surface naturally intersecting parts of these indurated layers at an angle like the ribs of a whale carcass exposed in a sea cliff. Materials like these that from depth that find their way to the surface can very often be natural and cannot be assumed to be 'fill materials'. Duripan fragments with lichen on them have been above ground for years, likely both from natural landscape degradation processes that pre-date even the earliest farming as well as from prior attempts at subsoiling as documented in the Butterworth (2015) and Skordal (2015) reports.

A final point to be made is the perhaps incorrect conceptualization and explanation made by the Expert Team in their report of the impact of tillage on most of the restrictive subsoils on the entire Duarte Site: That is, the Expert Team speaks again and again of the '*fracturing'* of the restrictive subsoil layers. The word has the sound of permanence. Yet in fact, in *all five of the dominant soil series* named in the map units of the areas of Riverbank Formation and Red Bluff Formation lands on the Duarte Site*,* the first restrictive layer hydrologically speaking is a clayey enriched argillic horizon. Even deep-shank ripper blades extending several feet deep are ineffectual in permanently draining (increasing the hydraulic conductivity) such 'claypan' soils because the high shrink-swell capacity of the clays combines with the seasonal wet-dry cycles of a xeric moisture regime to *swell shut* any tool marks within one or two seasons. Farmers in the Sacramento Valley have known for over one-hundred years not to waste money 'ripping' claypan soils because of the impermanence of the treatment in improving drainage.

So, are there any soil horizons or materials that can or do 'fracture' upon deep tillage? Yes, the indurated duripan of the Redding series soil is brittle and can be fractured; however, according the composition of the map units on the Duarte Site, the Redding series is predicted to make up 40% of the 'Corning-Redding gravelly loams 0-5 percent slopes map unit and in turn we estimate that this map unit makes up less than about 25% of the soils on the Duarte Site. In other words, soils with a layer that actually could be fractured make up only an estimated 10 percent (0.4 x 0.25) of the Duarte Site *and normally the duripan in that soil begins at a depth of 22 to 35 inches below the soil surface (Gowans et al. 1967)* except where exposed along stream cutbanks, etc., so tillage to 7 inches would have no impact at all on the duripan.

Lack of onsite soil profile descriptions by the Expert Team means that we must turn for the soil interpretations to the published *Soil Survey of Tehama County, California* (Gowans, 1967). Soil Map Unit Aw (Arbuckle gravelly loam, clayey substratum, 0 to 3 percent slopes) occurs in a low area onsite. To quote the Map Unit Description: "This soil is underlain by very slowly permeable clay or partly consolidated siltstone at depths of 3 to 6 feet." Tillage to 7 inches depth would have no effect on the Soil Hydrologic Group of this soil. Butterworth's (2015) report including 14 soil profile descriptions on the Duarte Site demonstrates that that depth of tillage would have no effect on the subsoils, that is, the slowly permeable layers on the Duarte Site.

Finally, here we reference Rains (2006) "*The role of perched aquifers in hydrological connectivity and biochemical process vernal pool landscapes"* In the conclusion section of the paper on page 30, which we insert below, Rains, who is a co Expert in the Lee Report, offers a conclusion regarding vernal pool – swale hydrology in relation to water quality that is perhaps the full opposite of the conclusion offered regarding the impact of farming activity on the Duarte Site:

CONCLUSIONS

The results of this study show that some vernal pools are supported by perched aquifers where in seasonal surface water and perched ground water hydrologically and biogeochemically connect uplands, vernal pools, and streams at the catchment scale. However, the degree of connectivity between the various stores is apparently governed by issues of spatial and temporal scale. The vernal pools and adjacent uplands are quite obviously hydrologically and biogeochemically connected. Perched groundwater flowed through the vernal pools, largely controlling vernal pool stage, electrical conductivity, and nitrate and DOC dynamics, particularly during and immediately following storm events. The vernal pools and seasonal stream also are quite obviously hydrologically connected. Surface water flowed out of the lower vernal pool, though the outlet swale, and into the seasonal stream for approximately 90days, and the perched aquifer maintained a saturated connection between the vernal pools and the seasonal stream throughout the wet season. However, the vernal pools and seasonal stream are not as obviously biogeochemically connected. The vernal pools comprise ~ 2% of the total catchment area, so most outlet swale water discharging to the seasonal stream was perched groundwater that had not flowed through the vernal pools. Therefore, though the uplands, vernal pools, and seasonal stream are

part of single surface water and perched groundwater system, the vernal pools apparently play a limited role in controlling landscape-scale water quality. (Highlight added.)

Summary and Discussion

The following are short critiques of the specific numbered items in *Section VI Summary and Discussion* of the Lee Report, beginning on their page 149:

Item 1. "… our approximation of the wetland and linear distance of streams is as follows:

a. *Total area of waters / wetlands = 1,912,017 ft^2 or 43 .9 acres. This acreage includes virtually all of the stream and wetlands delineated by North State in 1994 and Northstar in 2012 as water of the US under CWA."*

This statement, by the Lee Team's own admission, confirms there has not been reduction in reach or impairment of flow or circulation of regulated waters.

Item 2. "Coyote Creek Is One System:" The Duarte site has three through-flowing streams in the northern portion of the site, the others are disconnected, based on lack of three of three wetland indicators in swales. All the streams have been tilled historically and are Farmed Wetlands as is shown on the 1967 and 1979 aerial photographs in this report.

Item 3. "Coyote Creek Substantial Flows:" Where are the flows documented? In dry years many of the swales fail to contribute significant runoff to Coyote Creek. The southern half of the Duarte site consists of ephemeral streams. Some of the topography is relict from a time before the landform was beheaded from its source.

Item 4. "*Rivers and Streams ecosystem function*:" The Team of Experts wrote nothing for this section…

Item 5. "Duarte Site before late 2012 Waters/Wetland Ecosystem Functioning:" The Team of Experts is making a far-reaching assumption here. There is no way to know the Duarte Site was functioning similarly or differently. Everything asserted by the Team of Experts here is inference or hearsay based on a flawed HGM assessment.

Item 6. "Post Late Fall of 2012 Waters/Wetland Ecosystem Functioning:" These assessments are not credible because their Reference Sites are different than more than 75 percent of the Duarte Site.

Item 7. "Significant Nexus:" Data collected on chemical properties of water samples at seven (7) vernal pool and swale and thirteen (13) stream and canal data collection points spread across the Reference Sites and the Duarte Site appear to have been lumped and averaged as shown in

Table V-6 on page 74 of the Lee Report. The sample site locations are shown on Figure V-19 on page 78 of the Report. There is no apparent actual comparison of the chemical properties between the Duarte Site and the Reference Sites. The comparison is made instead between vernal pools, swales, and streams. The point of this is unclear, and it is in fact a far-reaching assumption to conclude a significant nexus determination for the Duarte Site, *"by inference"*, from these data. And note that the Table V-6 and Figure V-19 are inconsistent; the map shows 19 sample sites, which is different than the 20 sample locations shown in the table (n=7 + n=13 = 20).

Item 8. "Similarly Situated Waters/Wetlands:" In our opinion, most of the swales on the Duarte Site do not empty into a through-going trunk system to Coyote Creek. This is evidenced by Wetland Data Determination Forms collected by the Team of Experts on the Duarte Site, which do not show hydric soil indicators or hydrology for wetlands.

The Team of Experts leaned heavily and likely incorrectly in using the F8 Hydric indicator to make their hydric soils calls on the Assessment Sites. Following the guidelines in version 7.0 of the Field Indicators guide (USDA, 2010) it is to be applied only in closed basins. It is inappropriate to apply F8 in a swale or slough setting where there is an outlet. Therefore, attempts by the Team of Experts to make every low point on the landscape a jurisdictional wetland based on the F8 indicator is open to question. In lands supporting soils of HSG C, as does the majority of the Duarte Site, it is also reasonable to expect that swales of very low relief would only flash during major events. The groundwater table may be adding capillarity to the root system of dominantly facultative plants at depths below 12 inches, as the vegetation communities suggest: The swale of Area 13 supports 30 percent FacU or NL, while the swale of the Ag area are dominated by NL-UPL.

In addition, neither of these two Reference Sites should be evaluated by the "Alternative Condition" if they are judged by the Team of Experts as "pristine". If as we assert, the F8 indicator should not be used in the swales, the 31 Assessment Locations would have NO hydric soils, even if the wetland hydrology and wetland plant indicators are present. The vernal pools should be shown as "isolated". Only through-flowing streams, those that come from upslope and off site, would be considered "Waters". Broad areas of swale topography within the Duarte Site that lack three-of-three wetland indicators in our judgment should not be shown as jurisdictional wetlands. They have no nexus to Coyote Creek or Oat Creek.

Item 9. "Significant Nexus between similarly situated streams and wetlands within the Coyote Creek watershed and the Sacramento River:" No hard data (only inference) is presented to document that there are food resources (i.e., dissolved and particulate organic carbon; dissolved nutrients) traveling downstream. The Oat Creek monitoring site is 8 miles downstream of the Duarte Site. Other intensive agricultural operations exist between the

Duarte Site and the Oat Creek monitoring site, and therefore no clear conclusions can be made that water quality changes might be a result of activities on the Duarte Site.

Item 10. "Impact Event:" Normal tillage is exempt under §404(f)(1).

Item 11. "Discharges:" The tillage activity qualified as an Agricultural Area Exemption under CWA Section §404(f)(1):

> You do *not* generally need a permit under Section 404 if your discharges of dredged or fill material are associated with normal farming, ranching, or silviculture activities such as plowing, cultivating, minor drainage, and harvesting for the production of food, fiber, and forest products or upland soil and water conservation practices. This exemption pertains to "normal farming" and harvesting activities that are part of an established, ongoing farming or forestry operation.

Item 12. "Prior Tillage Operations": As shown by the evidence that we have presented here about the long history of farming of the Duarte Site and other matters shows, as well as evidence separately presented both by Skordal (2015) and Kelley (2015), the Team of Experts did not do the required due diligence to determine prior cropping.

Item 13. "Conversion of Use:" There is evidence that the Duarte Site was used for cropping prior to December 24, 1985. There has been no conversion of use. Marginal lands are never cropped every year but are fallowed to rebound. And as well, fluctuating commodity prices may affect rotations, livestock grazing versus cropping and even whether land is planted in a given year. The Team of Experts failed to uncover available documentary evidence of this critical aspect in their project site analysis. For example, in Figure 6 of this report, clearly all the streams on the Duarte Site had been tilled in 1979.

Item 14. "Sequencing": Under §404(f)(1) of the CWA, there is no requirement for "sequencing" or avoidance in cropping.

Item 15. "Tillage Practices consistent with Deep Tillage or Deep Ripping:" The Expert Teams' statement in their Item 15 is unsupportable by the actual data that they gathered and presented. Nowhere in their vast report and appendices did they document in their field data that the chisel shanks sank below 7 inches depth. Natural restrictive layers are much deeper than the reach of the tillage equipment that was used.

The Team of Experts maps show that wetland areas remain intact and there are no new areas of "Dry Land'. It is unclear why NRCS Practice Code 324 appears in this section, but Code 324 specifies no tillage depth. It is specifically for breaking up restrictive layers that are otherwise not a part of normal tillage. Tillage or chiseling to 7 inches depth, as documented by the Team of Experts, is a normal tillage practice for seed bed preparation. Conventional tillage, chiseling to a depth of 6 to 12 inches, is common practice. Normally after chiseling is completed, clods are broken up to smooth the ground for uniform drilling or if the crop is planted aerially some type of harrow is used to place seeds in contact with the soil particles.

The NRCS-CA electronic Field Office Tech Guide (eFOTG) presents standard equipment for tillage systems for seed bed preparation (conventional):

https://efotg.sc.egov.usda.gov/references/public/CA/Tillage2.pdf

Examples of standard tillage shown are much more aggressive than what occurred on the Duarte Site.

It is unclear to us why the Team of Experts chose to apply Practice Standard Deep Tillage (324). There are many other Practice Standards that fit the Duarte situation. Some others are: Forage and Biomass Planting (512); Herbaceous Weed Control (315); Prescribed Grazing (528), etc. The list is quite long – the point we are making is that any Practice Standard requiring seed propagation has criteria for seed bed preparation not dissimilar to what occurred on the Duarte site. Regardless, there was no federal money involved in the tillage project at Duarte site.

Item 16. "Comparison to Other Tillage Operations:" The comparison of the Duarte Site to the Borden Ranch is completely unwarranted and erroneous. In the Borden Ranch case, a **four to seven-foot-long ripper shank** was allegedly used, whereas at the Duarte Site documented tillage extended to an estimated **seven inches depth**. A seven-foot ripper shank could change the hydrologic soil group from D or C to B. The hydrologic soil groups on the Duarte Site could not be changed with seven inches of tillage.

The court rendering in the Borden Ranch matter reads as follows:

> "…Where there are two permissible views of the evidence, the factfinder's choice between them cannot be clearly erroneous." Cree v. Flores, 157 F.3d 762, 768 (9th Cir.1998). The district court here held a four-week bench trial, examined numerous exhibits, and heard over twenty witnesses. There is ample evidence to support the district court's findings. The court cited documentary evidence showing deep ripping, eyewitness testimony of deep ripping on the property, and Tsakopoulos's own concession that "mistakes had been made." The court also relied on the studies of Dr. Lyndon Lee, who conducted extensive investigations at the site. Dr. Lee was able to dig soil pits as far as thirty inches into the soil. By examining the composition of the soil in these pits, Dr. Lee could determine whether the underlying clay layer had been ripped up, consistent with deep ripping. The district court chose to credit this evidence that deep ripping had occurred, and we can find no clear error on this record"... (https://caselaw.findlaw.com/us-9th-circuit/1301025.html)

The Lee Report provides no such evidence at the Duarte site that deep ripping occurred. Their finding at the Duarte Site is 7 inches depth of tillage. Other expert reports (Butterworth and Kelley,2015) document 2 to 4 inches of tillage across the site. The explanation of impact is based on normal tillage operations that is an exempt activity and a determination methodology that is fundamentally flawed.

Item 17. "Impacts".

"A. Direct Impacts to Waters /Wetland Area and Function Direct impacts:"

Figure V-47 in the Lee Report is predicated on the HGM that is flawed, consequently the impacts should be set aside. Secondly, some areas of wetlands shown on V-33 a and 33b are other than jurisdictional, based on the Field Data Sheet information. Thirdly, activities are exempt under § 404 (f)(1).

(a) Activities associated with ongoing farming are exempt.

(b) There is no redistribution of materials.

(c) There are no measurements of changes in water quality or quantity at the inlets or outlets of streams to quantify these assertions. They are inferred from a flawed HGM and should be set aside

(d) There is no credible evidence showing that the subsoil was disturbed by tillage. Tillage occurred in the topsoil, well documented by the Lee Team. Distribution of native soil and elimination of shallow subsurface storage and timing in rate, volume and discharge are unsubstantiated.

(e) This section is redundant. There is no credible evidence that future elimination of waters/wetlands and significant changes in the extent and margins have occurred. The basis for this claim is flawed by the GHM model.

(f) Speculation. There is no way of knowing from the data presented that functioning native plant communities are damaged or unrecoverable.

(g) Speculation. No proof. It is impossible to make assertions about habitat and home range of species based on the flawed GHM model.

(h) "…in all likelihood" – no surveys presented. Speculation. a) complex structure, connectivity and extent of former intact waters/wetlands are still intact on the Duarte site. b) vernal pools were not filled; vernal pool fairy shrimp assessments require surveys. The populations still thrive regardless of tillage, as studies have shown.

"B. Indirect Impact to Waters / Wetland Ecosystem Function:"

There is nothing specifically addressed by the Team other than to say that everything, in the Team of Experts' opinion, is impacted. The Field Data Sheets presented document otherwise. All the "yes" boxes have been checked indicating that wetlands are present, although most fail to exhibit the minimum criteria for jurisdictional wetlands, contrary to the Team of Experts' interpretations.

Under §404(f)(1) activities of normal tillage are exempt.

"C. Indirect Cumulative and Temporal Impacts:"

1. Subsoil permeability would not have been affected by 7 inches of tillage.

2. The Lee Report does not show changes in the patters of water flow and circulation.

3. The HGM is found to be fatally flawed and findings form that assessment must be set aside.

4. Historic photography (1967) shows that all the wetlands have been farmed, so there is no basis for stating that farmed wetlands are irreparable. There is no documented loss in functioning. The HGM model presented by the Lee Team is dysfunctional and interpretation and inferences based on it must be set aside.

The mitigation section is unwarranted and unnecessary.

Opinion

Failure of the Team of Experts to provide even one formal soil profile description leads to inaccurate interpretations of industry standards in relation to runoff or hydrologic function.

The interpretation of the Team of Experts that the hydrologic function of soils on the Duarte Site were changed by tilling them to a depth of 7-10 inches in the soil profile is impossible in these deep alluvial soils. There was no change in topography, no wetlands were filled or lost, no wetlands were redirected, and the Expert Team presented no evidence that water exiting the site has been reduced from former flows.

The hydrogeomorphic (HGM) analysis is flawed by a fundamentally and frankly shockingly inaccurate conflation of "similar" landscapes. Further, as noted (Lee Report, Appendix D, page 5) "… Rather, users should note that both the reference system data and the best professional judgement of the DOJ Team were used to scale variables in this Guidebook". This statement is suspect at best, given the inaccuracy of the interpretations of the Team of Experts throughout their report and appendices.

Interpretations of site runoff are not quantified by any means other than by inference based on Reference sites. The subjectivity of the HGM methodology allows for bias and consequently erroneous conclusions.

Performance of minimal due diligence by the Expert Team of historic photographs of farming operations dating back to the 1960s would have shown them, succinctly, that ongoing farming and tillage operations in 2012 should be exempted by §404(f) (1) of the CWA, especially considering their finding of no deep ripping.

Water quality was not monitored at the inlets or the outlets of streams at the western and eastern or northern property lines. The Team made no actual assessments of water quality or quantity moving on or off the site. Instead they offered conjecture and inference based on their HGM. The HGM itself is deeply flawed.

Insufficient fieldwork, data collection, unfamiliarity with the Hydric Indicators and design of the assessment methodology fail to reach credible inferences, comparisons and conclusions.

Judging from the data sheets submitted by the Team of Experts, the swales are other than jurisdictional. The 1994 delineation is the only one that stands as ACOE verified. Through-flowing streams are Farmed Wetlands. The large number of swales that originate on site are other than jurisdictional, that is, those shown as streams 5, 6, 8, 9 and 10 (Lee Report, Figure V-33a).

Downstream of the Duarte Site, Coyote Creek threads its way through about 8 miles of very intensively farmed land prior to joining Oat Creek a short distance from the Sacramento River. Farming activities on the parcels downstream of the Duarte Site are far more intensive than what has been documented by the DOJ Team of Experts on the Duarte Site.

There is no way to discriminate between a contributor to water quality impacts, if any are determined to exist, from higher up in the watershed, short of monitoring every inlet and outlet of every stream, drainage ditch or culvert along the way.

References Cited

33 CFR § 323.4. Discharges not requiring permits (Army Corps regulations relative to special rules that apply to agricultural areas).

40 CFR § 232.3. Activities not requiring permits (EPA regulations relative to special rules that apply to agricultural areas).

Blake, M.C., D. S. Harwood, E. J. Helley, W. P Irwin, A. S. Jayko, and D. L. Jones. 1999. Geologic Map of the Red Bluff 30' x 60' Quadrangle, California. (1:100,000 scale). U.S. Geological Survey.

Busacca, Alan J. 1982. Geologic history and soil development, northeastern Sacramento Valley, California. University of California, Davis. Ph.D. Dissertation. 348p.

Busacca, A. J., M. J. Singer, and K. L. Verosub. 1989. Late Cenozoic stratigraphy of the Feather and Yuba Rivers area, California, with a section on soil development in mixed alluvium at Honcut Creek. In J. W. Harden (ed.) Soil chronosequences of the soil correlation and dating project. U. S. Geological Survey Bulletin 1590-G, 132 p.

Butterworth, Joel. 2015. In the Matter of Duarte Nurseery, Inc. v. The United States of America. ICF international, 630 K Street, Suite 400, Sacramento, CA 95814

California Department of Water Resources. 2014. *Geology of the Northern Sacramento Valley, California.* California Department of Water Resources Northern Region Office Groundwater and Geologic Investigations Section. Sacramento, CA. 213p. Accessed online at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Regional-Reports/Geology-of-the-Northern-Sacramento-Valley-California-June-2014.pdf

Clean Water Act Section 404, Policy and Guidance, Wetlands on Agricultural Lands. Available online at the following link: https://www.epa.gov/cwa-404-policy-and-guidance. Accessed Jan 2019.

EPA, Section 404(f)(1) of the Clean Water Act. Exemptions to Permit Requirements. https://www.epa.gov/cwa-404/exemptions-permit-requirements

Gowans, K.C. et al. 1967. *Soil Survey of Tehama County California*. USDA Soil Conservation Service and Forest Service in Cooperation with University of California Agricultural Extension Station.

Helley E.J. and D.S. Harwood. 1985. *Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California.* U.S. Geological Survey Miscellaneous Field Studies Map MF-1790: 24 pp. 5 sheets, scale 1:62,500.

Helley E.J. and C. Jaworowski. 1985. *The Red Bluff pediment, a datum plane for locating Quaternary structures in the Sacramento Valley, California.* Washington, DC: U.S. Government Printing Office. U.S. Geological Survey Bulletin 1628: 13 pp.

Holmes, L. C., J. W. Nelson, and Party. 1913. Reconnaissance Soil Survey of the Sacramento Valley, California. USDA Bureau of Soils. 148 pp. plus maps.

Kelley, David B. 2015. Expert Report of David B. Kelley in the matter of Duarte Nursery, Inc. v. United States of America. No. 2:13-CV-02095. Kelley and Associates Environmental Sciences, Inc. 20 E. Baker Street, Winters, CA 95694.

Lee, Lyndon C. et al., 2015. *U.S. Department of Justice Expert Team Report, Duarte Nursery, Inc et al US Army Corps of Engineers/United States v. Duarte Nursery, Inc. et al*. Environment and Natural Resource Defense Section, US Department of Justice, Washington DC.

Marchand D.E. and A. Allwardt. 1981. *Late Cenozoic stratigraphic units, northeastern San Joaquin Valley, California.* Washington: U.S. Government Printing Office. U.S. Geological Survey Bulletin 1470:1- 70.

Rains MC, Fogg GE, Harter T, Dahlgren RA, Williamson RJ. 2006. The role of perched aquifers in hydrological connectivity and biogeochemical processes in vernal pool landscapes, Central Valley, California. Hydrological Processes 20:1157-1175

Skordal, T. 2015*. Expert Report of Thomas Skordal In The Matter of Duarte Nursery, Inc. v. United States*. Prepared for Briscoe Ivester & Bazel LLP.

Soil Survey Staff. 2014. Keys to Soil Taxonomy, 12th ed. USDA-Natural Resources Conservation Service, Washington, DC.

U.S. Army Corps of Engineers. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West (Version 2)*, ed. J. S. Wakeley, R.W. Lichvar and C.V. Noble. ERDC/EL Tr-08028. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USDA, NRCS, 1978. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed Jan 2019.

USDA, NRCS, 2007. Hydrologic Soil Groups. Part 630 Hydrology. National Engineering Handbook. Chapter 7. https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba

USDA, NRCS – CA, eFOTG, *Conservation Practices*. https://efotg.sc.egov.usda.gov/#/details

USDA, NRCS, 2010. *Field Indicators of Hydric Soils in the United States, A Guide for Identifying and Delineating Hydric Soils. Version 7.0*. L. M. Vasilas, G. W. Hurt, C. v. Noble (eds.). USDA, NRCS in Cooperation with the National Technical Committee for Hydric Soils.

United States Court of Appeals, Ninth Circuit, 2001. BORDEN RANCH PARTNERSHIP; Angelo K. Tsakopoulos, Plaintiffs-Appellants, v. UNITED STATES ARMY CORPS OF ENGINEERS; United States Environmental Protection Agency, an agency of the United States, Defendants-Appellees. No. 00-15700. Decided: August 15, 2001. https://caselaw.findlaw.com/us-9th-circuit/1301025.htm